ENGIN
T
223
.A

Engin

Vol. 1053 Number 3

The University
of Michigan
Engineering
Library

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

JUN 1985
ENGINEERING
LIBRARY

Route to:

PATENTS

April 16, 1985

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

C 21.5: 1053/C

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

April 16, 1985 Volume 1053 Number 3

5-10-85

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1053 OG 42
Patent Cooperation Treaty (PCT) Update	1053 OG 42
Notice of Maintenance Fees Payable	1053 OG 42
Reissue Applications Filed	1053 OG 43
Requests for Reexaminations Filed	1053 OG 43
Marks Published for Opposition	1053 OG 43
Xerox License Offer	1053 OG 44
Amendments to Patent Cooperation Treaty	1053 OG 44
Decisions of the Assembly Concerning Articles 22(2) and 39(1)(a) of the (PCT) and Amendments to the Regulations Under the PCT	1053 OG 47
Patent Certificates of Correction	1053 OG 99
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1053 OG 100
Condition of Patent Applications	1053 OG 101
Reexaminations	989
Reissue Patents Granted (31,865)	993
Plant Patents Granted (5,436)	995
Patents Granted	
General and Mechanical (4,510,625)	997
Chemical (4,511,360)	1253
Electrical (4,511,755)	1359
Design Patents Granted (278,375)	1459
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 52
Classification of	
Patents (Including Reissues and Reexaminations)	PI 57
Designs and Plants	PI 60
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 61
Designs and Plants	PI 62
Change of Address Form and Subscription Order Form	Back Page

260

THE UNIVERSITY OF MICHIGAN
JUN 10 1985
ENGINEERING LIBRARY

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

85-395-A

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Jan. 3, 1985 and was announced in the *PCT Gazette* at No. 26/1984 page 3241 on Nov. 8, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1985 and were announced in the *PCT Gazette* at No. 25/1984 page 3095 on Oct. 25, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

Note that the amount of the international search fee for the European Patent Office will change effective May 7, 1985 and the amounts of the International PCT fees will change effective May 28, 1985. For information on these fee changes see the notice appearing in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	690.00
International fees	
Basic fee (first 30 pages)	265.00
Basic Supplemental fee (for each page over 30)	5.00
Designation fee (for the first 10 national or regional offices)	64.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Mar. 20, 1985. *Acting Commissioner of Patents and Trademarks.*

Patent Cooperation Treaty (PCT) Update

Change in international search fee charged by the European Patent Office (EPO) effective May 7, 1985 and change in International Fees effective May 28, 1985.

The International Bureau of the World Intellectual Property Organization has informed the US Patent and Trademark Office that, due to the favorable exchange rate of the US dollar with regard to the Deutschmark and the Swiss franc, the dollar amount of the international search fee charged by the European Patent Office and the International Fees for PCT applications filed in the United States Receiving Office will decrease.

Effective May 7, 1985 the amount of the international search fee charged by the European Patent Office for PCT applications filed in the United States Receiving Office will be $620.00.

Effective May 28, 1985 the amount of the International Fees for PCT applications filed in the United States Receiving Office will be:

Basic Fee (first 30 pages)	$230.00
Basic Supplemental Fee (each page over 30)	4.00
Designation Fee (per country or region up to ten)	55.00
Designation Fee (for 11th and subsequent countries or regions)	No Charge

DONALD J. QUIGG,
Mar. 20, 1985. *Acting Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Apr. 13, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,324,003 through 4,325,147

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f))	$ 200.00
By other than a small entity	$ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) $ 50.00
By other than a small entity $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,642,742, Re. S.N. 706,313, Filed Feb. 27, 1985, Cl. 526/206, TOUGH, STABLE TETRAFLUOROETHYLENE-FLUOROALKYL PERFLUOROVINYL ETHER COPOLYMERS, Dana P. Carlson, Owner of Record: *E. I. duPont de Nemours and Co., Wilmington, Del.,* Attorney or Agent: Gary A. Samuels, Ex. Gp.: 155

3,921,273, Re. S.N. 623,398, Filed June 22, 1984, Cl. 29/157R, METHOD OF FILLING A CASING WITH HEAT INSULATING FIBERS, Katsumi Kondo, et al., Owner of Record: *Toyota Jidosha Kabushiki Kaisha, Aichi-Ken, Japan,* Attorney or Agent: David R. Murphy, et al., Ex. Gp.: 326

4,228,424, Re. S.N. 700,778, Filed Feb. 12, 1985, Cl. 340/506, CENTRAL STATION ALARM, Tom W. Lenay, et al., Owner of Record: *Baker Protective Services, Inc., Beverly Hills, Calif.,* Attorney or Agent: Frank F. Scheck, et al., Ex. Gp.: 268

4,428,759, Re. S.N. 704,180, Filed Feb. 22, 1985, Cl. 62/017, DISTILLATIVE SEPARATION EMPLOYING BOTTOM ADDITIVES, James M. Ryan, et al., Owner of Record: *Koch Process Systems, Inc., Westboro, Mass.,* Attorney or Agent: Richard P. Crowley, Ex. Gp.: 133

4,448,815, Re. S.N. 706,206, Filed Feb. 25, 1985, Cl. 427/387, MULTI-COMPONENT SOLVENTLESS SILICONE RELEASE COATING SYSTEM, Maurice E. Grenoble, et al., Owner of Record: *General Electric Co., Waterford, N.Y.,* Attorney or Agent: John L. Young, et al., Ex. Gp.: 152

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,485,120, Reexam. No. 90/000,739, Requested: Mar. 14, 1985, Cl. 83/37, METHOD AND APPARATUS FOR CUTTING ELONGATED MATERIAL, Garland B. Keith, Owner of Record: *Lummus Industries, Inc., Columbus, Ga.,* Attorney or Agent: Richards, Harris & Medlock, Ex. Gp.: 320, Requester: D. M. & E. Corp., Shelby, N.C.

4,285,349, Reexam. No. 90/000,741, Requested: Mar. 15, 1985, Cl. 131/17, USE OF CERTAIN BRIDGED KETONES IN AUGMENTING OR ENHANCING THE ORGANOLEPTIC PROPERTIES OF SMOKING TOBACCO, Mark A. Sprecker, et al., Owner of Record: *International Flavors & Fragrances, Inc., New York, N.Y.,* Attorney or Agent: Arthur L. Liberman, Ex. Gp.: 330, Requester: Owner

4,288,327, Reexam. No. 90/000,737, Requested: Mar. 11, 1985, Cl. 210/698, COPOLYMERS FOR THE CONTROL OF THE FORMATION AND DEPOSITION OF MATERIALS IN AQUEOUS MEDIUMS, Irene T. Godlewski, et al., Owner of Record: *Betz Laboratories, Inc., Trevose, Pa.,* Attorney or Agent: Alexander D. Ricci, Ex. Gp.: 130, Requester: Epstein & Edell, Arlington, Va.

4,381,855, Reexam. No. 90/000,735, Requested: Mar. 11, 1985, Cl. 266/248, TECHNIQUE FOR CONSERVING HOT METAL TEMPERATURE, John P. Ryan, Owner of Record: *Industrial Machine Works, Inc., Etna, Pa.,* Attorney or Agent: Yeager & Cornelius, Ex. Gp.: 110, Requester: Owner

Marks Published for Opposition

The Apr. issues of the Official Gazette (Trademark Section) will present marks published for opposition in two separate sections.

Each section will contain both multiple class and single class applications. The first section will be printed at the beginning of the Official Gazette and the second section will be printed at the end of the Official Gazette, after the Index of Registrants.

The second section will be numbered separately from the first section, and each page will bear the notation Ap.

MARGARET M. LAURENCE,
Jan. 10, 1985. *Assistant Commissioner for Trademarks.*

XEROX LICENSE OFFER

This notice is published pursuant to a CONSENT ORDER TO CEASE AND DESIST dated July 29, 1975, as modified Sept. 10, 1982, between Xerox Corp. and the Federal Trade Commission.

TERMS *contained in this notice are defined in the Consent Order. All interested parties should refer to that document for the definitions and additional details of Xerox' patent and know-how licensing obligations thereunder.* A copy of the Consent Order and a list of PATENTS licensed to Xerox which are subject to the provisions of paragraphs II and IV (C) (9) of the Order, if any, are available from Xerox upon written request. All such requests and any request relating to the licensing of PATENTS pursuant to the Consent Order should be made in writing and addressed to:

The Manager of Patent Licensing
Xerox Corp.
P.O. Box 1600
Stamford, Conn. 06904

Xerox shall, in accordance with the terms of the Consent Order, grant licenses under

(a) its ORDER PATENTS to make, have made, use and vend OFFICE COPIER PRODUCTS under the terms of the Consent Order; and

(b) patents which are required to be licensed pursuant to the terms of paragraph X of the Consent Order, if any.

The following is a list of patents which is believed to include all of the PATENTS available for licensing in accordance with the terms of the Consent Order issued since the publication of the last notice by Xerox (1036 OG 3). A copy of the classification index for the listed patents also appears at 1012 OG-55. Since the classification system is not restricted solely to OFFICE COPIER PRODUCTS, there are several patents included in the list to which the Consent Order is not applicable.

XEROX PATENTS

CLASS: 10A

4,459,013.—DUPLEX/SIMPLEX PRECOLLATION COPYING SYSTEM. July 10, 1984. BEL. 869,792, CAN. 1,128,970, FRA. 7,823,869, GRB. 1,605,090.

CLASS: 10F

4,459,013.—DUPLEX/SIMPLEX PRECOLLATION COPYING SYSTEM. July 10, 1984. BEL. 869,792, CAN 1,128,970, FRA. 7,823,869, GRB. 1,605,090.

Amendments to Patent Cooperation Treaty

The 11th session of the PCT Union Assembly held in Geneva, Switzerland from 30 Jan. to 3 Feb. 1984 decided to amend two time limits in the Treaty (Articles 22(2) and 39(1)(a)) and to revise approximately one hundred provisions in the PCT Regulations.

The assembly decided that all amendments would enter into force on Jan. 1, 1985, subject to the following:

(i) the amendments to Rules 12.1(c) and (d), 34.1 and 48.3(a) and (b) will become applicable at the same time that the PCT will enter into force in respect of the first Spanish speaking country to ratify or accede to the PCT;

(ii) the deletion of Rule 80.6(b) will become effective on Jan. 1, 1986;

(iii) some countries may, under certain circumstances, delay, for a transitory period, the application, by them, of some of the amendments. Delays required by U.S. law are noted below.

The purpose and a brief description of the most important amendments are indicated below.

Making the Procedure During the International Phase Under Chapter I of the PCT Safer and Simpler for the Applicant.

The Assembly adopted very important amendments giving the applicant the means to ensure that his or her international application will not be lost because the record copy has not reached the International Bureau in due time (see Rules 20.5 and 22.1). The time limit at the expiration of which the international application would be considered withdrawn under Article 12(3) if the record copy had not reached the International Bureau will start running only when a notification is sent by the International Bureau to the applicant (see Rule 22.3), and the new system as resulting from those various amendments will completely replace the "alternative" procedure previously provided by Rule 22.2.

Other amendments will have the effect that the one-month grace period for the payment of the international fee and the search fee will be granted by all Receiving Offices, subject to some transitional provisions, (see Rule 15.4).

Amendments were adopted which will expressly allow the time limits fixed by the Receiving Office for the correction of defects to be extended and will ensure that no international application will be considered withdrawn by the Receiving Office for lack of compliance with physical requirements if it complies with those requirements to the extent necessary for the purpose of reasonably uniform international publication (see Rule 26).

The time limit within which the applicant may amend the claims during the international phase will be longer in certain cases. Furthermore, the applicant will have the possibility to state more in his or her explanations of amendments and will be permitted to submit the amendments in the language of publication only. (See Rule 46).

The amendments to Rules 32 and 32 bis, make it possible to withdraw the international application, designations, or the priority claim by filing a notice with the Receiving Office even after the latter has sent the record copy to the International Bureau. The Assembly noted that the international application would not be published if the withdrawal reached the International Bureau before the completion of the technical preparation for international publication, which is not earlier than 15 days before the expiration of 18 months from the priority date.

The rules concerning the rectification, during the international phase, of obvious errors in documents were liberalized by allowing the rectification of obvious errors which are not errors of transcription (see Rule 91). Furthermore, the applicant may, if the rectification has been refused during the international phase, obtain publication of the request for rectification in the pamphlet publishing the international application. Such publication, however, will not relieve the applicant from the need to request, during the national phase, the Designated Offices to authorize the rectification.

New rules were adopted which deal with Designated States excusing delays in meeting certain time limits, in particular, time limits pertaining to the international phase and the time limit for entering the national phase (see Rule 82bis). In that connection, it was understood by the Assembly that the excusing of the delay may take place only during the national phase and under the conditions set forth by the national law.

Making the Procedure Under Chapter II of the PCT More Attractive for the Applicant.

A very important amendment adopted by the Assembly consisted of modifying the time limit under Article

Article 39(1)(a) for entering the national phase before elected Offices. Subject to some transitory provisions, the 25 month time limit has been extended to 30 months. The Assembly also decided to extend the time limit to 28 months from the priority date to establish the international preliminary examination report: where preliminary examination has been demanded before the expiration of the 19th month from the priority date. The said extensions give applicants more opportunities to present arguments to the International Preliminary Examining Authority and more time for thorough international preliminary examination. (See Article 39 and Rules 66.4 and 69.)

Note that Chapter II procedure is *not* currently available to United States residents or nationals filing in the United States Receiving Office or to international applications as to designations of the United States of America.

Making it Safer and Simpler for the Applicant to Enter the National Phase.

The Assembly modified the time limit under Article 22(2) in order to harmonize it with the time limit under Article 22(1). This amendment means that, subject to some transitory provisions, the time limit for entering the national phase before the Designated Offices will be 20 months from the priority date in *all* cases, even where the International Searching Authority declares that no international search report will be established. In the latter case, under the previous text, the time limit was shorter.

The Assembly adopted new rules specifying the requirements for entering the national phase, in particular, the contents of the translation of the international application to be furnished when entering the national phase. (see Rules 49.3 to 49.5, 51 bis and 74). It is now clear that the applicant must be given an opportunity *after* entering the national phase before the Designated Office, for furnishing evidence—where evidence is required under the national law—as to the identity of the inventor if not the applicant, the applicant's right to file when he or she is not the inventor or circumstances making an earlier disclosure non-prejudicial. Also, if the applicant did not appoint a local agent when the national phase is entered, that he or she must be given an opportunity, *after* entering the national phase, to appoint a local agent where he or she is, under the national law, obliged to be represented by such an agent.

Including Certain Patent Documents Published in the Spanish Language into the PCT Minimum Documentation and Including the Spanish Language Among the Languages of Publication of International Applications.

It is expected that the very important amendments adopted by the Assembly in that connection will make it easier for Spain and for Spanish-speaking countries of Latin America to join the PCT Union (see Rules 12.1(c) and (d), 34.1 and 48.3(a) and (b)).

Simplifying the Tasks of the International Authorities Involved in the PCT Procedure and Simplifying the PCT Regulations in General.

The Assembly adopted a number of amendments in that connection, in particular, through the transfer of Rules or parts of Rules which are of no direct interest to applicants to the Administrative Instructions under the PCT and the deletion of some obsolete Rules. It is to be expected that after this very comprehensive revision of the Regulations, there will be a longer period during which no, or only very few, changes will be necessary in the PCT system.

Comments on particular changes:

Decisions Concerning Articles 22(2) and 39(1)(a)

Decision concerning Article 22(2)

The Assembly, in order to make the same time limit applicable under paragraphs (1) and (2) of Article 22, decided as follows:

Article 22(2) is modified as follows:

"*Where the International Searching Authority makes a declaration, under Article 17(2)(a), that no international search report will be established, the time limit for performing the acts referred to in paragraph (1) of this Article shall be *the same as that provided for in paragraph (1)*."

The modification consists of replacing the words "two months from the date of the notification sent to the applicant of the said declaration" by the underlined, it also consists of deleting, before the word "Where," the words "Notwithstanding the provisions of paragraph (1)".

The modification entered into force on Jan. 1, 1985. However, as long as that time limit is incompatible with the national law applied by the Designated Office, a time limit of two months from the date of the notification sent to the applicant of the said declaration shall, during that transitory period, apply with respect to that Designated Office, provided that such Office has made a notification to that effect to the International Bureau.

Decision Concerning Article 39(1)(a)

The Assembly, in order to extend the time limit under Article 39(1)(a) from 25 to 30 months from the priority date, decided as follows:

Article 39(1)(a) is modified as follows:

"if the selection of any Contracting State has been effected prior to the expiration of the 19th month from the priority date, the provisions of Article 22 shall not apply to such State and the applicant shall furnish a copy of the international application (unless the communication under Article 20 has already taken place) and a translation thereof (as prescribed), and pay the national fee (if any), to each elected Office not later than at the expiration of 30 months from the priority date."

The modification consists of changing "25" to "30".

As noted above, Article 39 relates to procedures under Chapter II which are not currently available to applicants filing in the United States Receiving Office or in international applications when entering the United States as a Designated Office.

The modification of Article 39 entered into force on January 1, 1985. However as long as the said time limit of 30 months is incompatible in all cases with the national law applied by the elected Office, a time limit of 25 months from the priority date shall, during that transitory period, apply with respect to that elected Office, provided that such Office has made a notification to that effect to the International Bureau.

Attention is Directed to Important Amendments to the Regulations Affecting United States Applicants.

Rule 4 relates to the contents of the Request. The changes provide for correction of any obvious errors and correction of the application number of the priority application before the Receiving Office.

Rule 15.4: The amendment sets the period for payment of the basic fee and the international search fee to all the Receiving Offices at one month from the date on which the international application was received; the same applies to the period for payment of designation fees when the application is filed on expiry of the priority period. The provisions in paragraphs (a) and (b) are not yet in effect in the United States under the provisions of Rule 15.4(d).

The amendment makes it clear that the amount to be paid when the fees or their equivalents are increased between the date of filing of the application and the date of payment; the amount to be paid is the lower amount.

Rules 22.1(b) and 22.3 together with Rule 20.5(c): These amendments provide for a system whereby the International Bureau monitors the receipt of the record copy of the international application, and the Receiving Office, and where appropriate the applicant, is notified so that the record copy can be produced if the Receiving Office is late in sending it; at the same time, the

amended version of Rule 22.3 introduces a new time limit under Article 12(3) of the Treaty, which begins when such notifications are sent out.

Rule 26.2: Under certain circumstances, the rule now provides that the Receiving Office can extend the time limit for the correction of certain elements in the international application.

Rule 46: The amended Rule makes it easier to submit amended claims within the time limit during the international phase.

Rules 49.5 and 51bis: The new Rules set out the conditions applying to entry into the national or regional phase and in particular those concerning the contents of and physical requirements for the translation under Article 22(1) or 39(1) of the Treaty and the national requirements dealt with in Article 27.

Rule 91: The main purpose of the amendments to this Rule is to enable the applicant, on payment of a fee, to request the publication, at the same time as the international application, of a request for rectification which has been rejected during the international phase.

A copy of the amendments to the PCT Articles and Rules appears below.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Mar. 8, 1985.

Decisions of the Assembly Concerning Articles 22(2) and 39(1)(a) of the Patent Cooperation Treaty (PCT) and Amendments to the Regulations Under the PCT as Adopted by the Assembly

Decisions Concerning Articles 22(2) and 39(1)(a)
Decision Concerning Article 22(2)

The Assembly, in order to make the same time limit applicable under paragraphs (1) and (2) of Article 22, decides as follows:

(1) Article 22(2) is modified as follows:

"Where the International Searching Authority makes a declaration, under Article 17(2)(a), that no international search report will be established, the time limit for performing the acts referred to in paragraph (1) of this Article shall be *the same as that provided for in paragraph (1).*"

(2) The modification enters into force on Jan. 1, 1985. However, as long as that time limit is incompatible with the national law applied by the designated Office, a time limit of two months from the date of the notification sent to the applicant of the said declaration shall, during that transitory period, apply with respect to that designated Office, provided that such Office has made a notification to that effect to the International Bureau.

(3) The notification referred to in paragraph (2) shall be addressed to the International Bureau before Oct. 1, 1984. It shall be promptly published by the International Bureau in the Gazette, and it shall become effective on Jan. 1, 1985.

(4) Any notification effected under paragraph (3) may be withdrawn at any time. Such withdrawal shall be promptly published by the International Bureau in the Gazette, and it shall be effective 2 months after its publication in the Gazette or at any later date as indicated in the notice of withdrawal.

---

*The modification consists of replacing the words "two months from the date of the notification sent to the applicant of the said declaration" by the words underlined; it also consists of deleting, before the word "Where," the words "Notwithstanding the provisions of paragraph (1),"

Decision Concerning Article 39(1)(a)

The Assembly, in order to extend the time limit under Article 39(1)(a) from 25 to 30 months from the priority date, decides as follows:

(1) Article 39(1)(a) is modified as follows:

"If the election of any Contracting State has been effected prior to the expiration of the 19th month from the priority date, the provisions of Article 22 shall not apply to such State and the applicant shall furnish a copy of the international application (unless the communication under Article 20 has already taken place) and a translation thereof (as prescribed), and pay the national fee (if any), to each elected Office not later than at the expiration of *30** months from the priority date."

(2) The modification enters into force on Jan. 1, 1985. However, as long as the said time limit of 30 months is incompatible in all cases with the national law applied by the elected Office, a time limit of 25 months from the priority date shall, during that transitory period, apply with respect to that elected Office, provided that such Office has made a notification to that effect to the International Bureau.

(3) The notification referred to in paragraph (2) shall be addressed to the International Bureau before Oct. 1, 1984. It shall be promptly published by the International Bureau in the Gazette, and it shall become effective on Jan. 1, 1985.

(4) Any notification effected under paragraph (3) may be withdrawn at any time. Such withdrawal shall be promptly published by the International Bureau in the Gazette, and it shall be effective 2 months after its publication in the Gazette or at any later date as indicated in the notice of withdrawal.

*The modification consists of changing "25" to "30."

Amendments to the Regulations*
Rule 4
The Request (Contents)

4.1 to 4.9 [No change]

4.10 Priority Claim
(a) [No change]
(b) If the request does not indicate both
(i) When the earlier application is not a regional or an international application, the country in which it was filed; when the earlier application is a regional or an international application, at least one country for which it was filed, and
(ii) the date on which it was filed,
the priority claim shall, for the purpose of the procedure under the Treaty, be considered not to have been made except where, resulting from an obvious error **, the indication of the said country or the said date is missing or is erroneous; whenever the identity or correct identity of the said country, or the said date or the correct date, may be established on the basis of the copy of the earlier application which reaches the receiving Office before it transmits the record copy to the International Bureau, the error shall be considered as an obvious error.
(c) If the application number of the earlier application is not indicated in the request but is furnished by the applicant to the International Bureau *or to the receiving Office* prior to the expiration of the 16th month from the priority date, it shall be considered by all designated States to have been furnished in time.***
(d) If the filing date of the earlier application as indicated in the request does not fall within the period of one year preceding the international filing date, the receiving Office, or, if the receiving Office has failed to do so, the International Bureau, shall invite the applicant to ask either for the cancellation of the declaration made under Article 8(1) or, if the date of the earlier application was indicated erroneously, for the correction of the date so indicated. If the applicant fails to act accordingly within 1 month from the date of the invitation, the declaration made under Article 8(1) shall be cancelled ex officio.****
(e) [No change]

4.11 to 4.16 [No change]

*Where the amendment consists of one or more new words, it or they are underlined (the word or words which is or are replaced are not indicated). Where the amendment consists of deleting one or more words, without replacing it or them, this fact is indicated in footnotes.
**The amendment consists of deleting, after the word "error," the words "of transcription."
***The amendment also consists of deleting the last two sentences of this paragraph.
****The amendment consists of deleting the last two sentences of the present text of this paragraph.

4.17 Additional* Matter

(a) The request shall contain no matter other than that specified in Rules 4.1 to 4.16, *provided that the Administrative Instructions may permit, but cannot make mandatory, the inclusion in the request of any additional matter specified in the Administrative Instructions.*

(b) If the request contains matter other than that specified in Rules 4.1 to 4.16 *or permitted under paragraph (a) by the Administrative Instructions,* the receiving Office shall ex officio delete the additional matter.

*The amendment consists of deleting the word "No" before the word "Additional."

Rule C
The Claims

6.1 to 6.3 [No change]

6.4 Dependent Claims

(a) Any claim which includes all the features of one or more other claims (claim in dependent form, hereinafter referred to as "dependent claim") shall do so by a reference, if possible at the beginning, to the other claim or claims and shall then state the additional features claimed. Any dependent claim which refers to more than one other claim ("multiple dependent claim") shall refer to such claims in the alternative only. Multiple dependent claims shall not serve as a basis for any other multiple dependent claim. *Where the national law of the national Office acting as International Searching Authority does not allow multiple dependent claims to be drafted in a manner different from that provided for in the preceding two sentences, failure to use that manner of claiming may result in an indication under Article 17(2)(b) in the international search report. Failure to use the said manner of claiming shall have no effect in a designated State if the manner of claiming actually used satisfies the national law of that State.*

(b) and (c) [No change]

6.5 [No Change]

Rule 8
The Abstract

8.1 [No change]

8.2 Figure

(a) If the applicant fails to make the indication referred to in Rule 3.3(a)(iii), or if the International Searching Authority finds that a figure or figures other than that figure or those figures suggested by the applicant would, among all the figures of all the drawings, better characterize the invention, it shall, *subject to paragraph (b),* indicate the figure or figures which *should accompany the abstract when the latter is published by the International Bureau. In such case, the abstract* shall *be accompanied by* the figure or figures so indicated by the International Searching Authority. Otherwise, the *abstract shall, subject to paragraph (b), be accompanied by* the figure or figures suggested by the applicant.

(b) *If the International Searching Authority finds that none of the figures of the drawings is useful for the understanding of the abstract, it shall notify the International Bureau accordingly. In such case, the abstract, when published by the International Bureau, shall not be accompanied by any figure of the drawings even where the applicant has made a suggestion under Rule 3.3(a)(iii).*

8.3 [*No change*]

Rule 11
Physical Requirements of the International Application

11.1 to 11.14 [No change]

11.15 Translations
[*Deleted*]

Rule 12
Language of the International Application

12.1 *Admitted Languages*

(a) Any international application shall be filed in the language, or one of the languages, specified in the agreement concluded between the International Bureau and the International Searching Authority competent for the international searching of that application, provided that, if the agreement specifies several languages, the receiving Office may prescribe among the specified languages that language in which or those languages in one of which the international application must be filed.

(b) *If the international application is filed in a language other than the language in which it is to be published, the request may, notwithstanding paragraph (a), be filed in the language of publication.*

(c) *Subject to paragraph (d), where the official language of the receiving Office is one of the languages referred to in Rule 48.3(a) but is a language not specified in the agreement referred to in paragraph (a), the international application may be filed in the said official language. If the international application is filed in the said official language, the search copy transmitted to the International Searching Authority under Rule 23.1 shall be accompanied by a translation into the language, or one of the languages, specified in the agreement referred to in paragraph (a); such translation shall be prepared under the responsibility of the receiving Office.*

(d) *Paragraph (c) shall apply only where the International Searching Authority has declared, in a notification addressed to the International Bureau, that it accepts to search international applications on the basis of the translation referred to in paragraph (c).*

12.2 Language of Changes in the International Application

Any changes in the international application, such as amendments and corrections, shall, *subject to Rules 46.3 and 66.9,* be in the same language as the said *application.*•

•The amendment also consists of deleting, after the word "application," the expression "(cf. Rule 66.5)."

Rule 13bis
Microbiological Inventions

13bis.1 to 13bis.6 ([No change]

13bis.7 National Requirements: Notification and Publication

(a) [No change]

(b) Each national Office shall notify the International Bureau* of the depositary institutions with which the national law permits deposits of microorganisms to be made for the purposes of patent procedure before that Office or, if the national law does not provide for or permit such deposits, of that fact.

(c) [No change]

*The amendment consists of deleting, after the word "Bureau," the following words: "a first time before entry into force of this Rule and then each time a change occurs."

Rule 15
The International Fee

15.1 to 15.3 [No change]

15.4 Time of Payment

(a) *The basic fee shall be paid within one month from the date of receipt of the international application.*

(b) *The designation fee shall be paid:*

(i) *where the international application does not contain a priority claim under Article 8, within one year from the date of receipt of the international application.*

(ii) *where the international application contains a priority claim under Article 8, within one year from the priority date or within one month from the date of receipt of the international application if that month expires after the expiration of one year from the priority date.*

(c) *Where the basic fee or the designation fee is paid later than the date on which the international application was received and where the amount of that fee is, in the currency in which it is payable, higher on the date of payment ("the higher amount") than it was on the date on which the international application was received ("the lower amount"),*

(i) *the lower amount shall be due if the fee is paid within one month from the date of receipt of the international application.*

(ii) *the higher amount shall be due if the fee is paid later than one month from the date of receipt of the international application.*

(d) *If, on Feb. 3, 1984, paragraphs (a) and (b) are not compatible with the national law applied by the receiving Office and as long as they continue to be not compatible with that law, the basic fee shall be paid on the date of receipt of the international application and the designation fee shall be paid within one year from the priority date.*

15.5 [No change: remains *deleted*]

15.6 [No change]

Rule 16bis
Advancing Fees by the International Bureau

16bis.1 Guarantee by the International Bureau

(a) Where, by the time they are due under Rule 14.1(b), Rule 15.4(a)* and Rule 16.1(f), the receiving Office finds that in respect of an international application no fees were paid to it by the applicant, or that the amount paid to it by the applicant is less than what is necessary to cover the transmittal fee, the basic fee and the search fee, the receiving Office shall charge the amount required to cover those fees, or the missing part thereof, to the International Bureau and shall consider the said amount as if it had been paid by the applicant at the due time.

(b) Where, by the time** they are due under Rule 15.4(b)*, the receiving Office finds that in respect of an international application the payment made by the applicant is insufficient to cover the designation fees necessary to cover the designations, the receiving Office shall charge the amount required to cover those fees to the International Bureau and shall consider that amount as if it had been paid by the applicant at the due time.

(c) [No change]

(d) [*Deleted*]

16 bis .2 Obligations of the Applicant, Etc.

(a) to (c) [No change]

(d) to (g) [*Deleted*]

16bis.3 Notifications

[*Deleted*]

*The amendment consists of deleting the reference to paragraph (c).

**The amendment consists of deleting, after the word "time," the words "it or."

Rule 17
The Priority Document

17.1 Obligation to Submit Copy of Earlier National Application

(a) Where the priority of an earlier national application is claimed under Article 8 in the international application, a copy of the said national application, certified by the authority with which it was filed ("the priority document"), shall, unless already filed with the receiving Office together with the international application, be submitted by the applicant to the International Bureau or to the receiving Office not later than 16 months after the priority date or, in the case referred to in Article 23(2), not later than at the time the processing or examination is requested.*

(b) Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to transmit the priority document to the International Bureau. Such request shall be made not later than the expiration of the applicable time limit referred to under paragraph (a) and may be subjected by the receiving Office to the payment of a fee.**

(c) [No change]

(d) [*Deleted*]

17.2 [No change]

*The amendment consists of deleting the last two sentences of this paragraph.
**The amendment consists of deleting the last sentence of this paragraph.

Rule 20
Receipt of the International Application

20.1 to 20.4 [No change]

20.5 Positive Determination
(a) [No change]
(b) [No change]
(c) The receiving Office shall promptly notify the applicant of the international application number and the international filing date. *At the same time, it shall send to the International Bureau a copy of the notification sent to the applicant, except where it has already sent, or is sending at the same time, the record copy to the International Bureau under Rule 22.1(a).*

20.6 to 20.9 [No change]

Rule 22
Transmittal of the Record Copy

22.1 Procedure
(a) [No change]
(b) *If the International Bureau has received a copy of the notification under Rule 20.5(c) but is not, by the expiration of 13 months from the priority date, in possession of the record copy, it shall remind the receiving Office that it should transmit the record copy to the International Bureau promptly.*
(c) *If the International Bureau has received a copy of the notification under Rule 20.5(c) but is not, by the expiration of 14 months from the priority date, in possession of the record copy, it shall notify the applicant and the receiving Office accordingly.*
(d) *After the expiration of 14 months from the priority date, the applicant may request the receiving Office to certify a copy of his international application as being identical with the international application as filed and may transmit such certified copy to the International Bureau.*
(e) *Any certification under paragraph (d) shall be free of charge and may be refused only on any of the following grounds:*
(i) *the copy which the receiving Office has been requested to certify is not identical with the international application as filed;*
(ii) *prescriptions concerning national security prevent the international application from being treated as such;*
(iii) *the receiving Office has already transmitted the record copy to the International Bureau and that Bureau has informed the receiving Office that it has received the record copy.*
(f) *Unless the International Bureau has received the record copy, or until it receives the record copy, the copy certified under paragraph (e) and received by the International Bureau shall be considered to be the record copy.*
(g) *If, by the expiration of the time limit applicable under Article 22, the applicant has performed the acts referred to in that Article but the designated Office has not been informed by the International Bureau of the receipt of the record copy, the designated Office shall inform the International Bureau. If the International Bureau is not in possession of the record copy, it shall promptly notify the applicant and the receiving Office unless it has already notified them under paragraph (c).*

22.2 Alternative Procedure
[*Deleted*]

22.3 Time Limit under Article 12(3)
The time limit referred to in Article 12(3) shall be *3 months from the date of the notification sent by the International Bureau to the applicant under Rule 22.1(c) 21 or (g).*

22.4 Statistics Concerning Non-Compliance with Rules 22.1 and 22.2
[*Deleted*]

22.5 Documents Filed with the International Application
[*Deleted*]

Rule 23
Transmittal of the Search Copy

23.1 Procedure

(a) The search copy shall be transmitted by the receiving Office to the International Searching Authority at the latest on the same day as the record copy is transmitted to the International Bureau.*

(b) If the International Bureau has not received, within 10 days from the receipt of the record copy, information from the International Searching Authority that that Authority is in possession of the search copy, the International Bureau shall promptly transmit a copy of the international application to the International Searching Authority.**

(c) [*Deleted*]

*The amendment consists of deleting, at the end of the present text of this paragraph, the words "or, under Rule 22.2(d), to the applicant."

**The amendment consists of deleting the second sentence of this paragraph.

Rule 24
Receipt of the Record Copy by the International Bureau

24.1 Recording of Date of Receipt of the Record Copy
[*Deleted*]

24.2 [No change]

Rule 26

Checking *By,* and Correcting *Before, the Receiving Office of* Certain Elements of the International Application

26.1 [No change]26.2 Time Limit for Correction

The time limit referred to in Article 14(1)(b) shall be reasonable under the circumstances* and shall be fixed in each case by the receiving Office. It shall not be less than 1 month** from the date of the invitation to correct. *It may be extended by the receiving Office at any time before a decision is taken.*

26.3 Checking of Physical Requirements under Article 14(1)(a)(v)

The physical requirements referred to in Rule 11 shall be checked *only* to the extent that compliance therewith is necessary for the purpose of reasonably uniform international publication.

26.3*bis Invitation to Correct Defects under Article 14(1)(b)*

The receiving Office shall not be required to issue the invitation to correct a defect under Article 14(1)(a)(v) where the physical requirements referred to in Rule 11 are complied with to the extent necessary for the purpose of reasonably uniform international publication.

26.4 Procedure

(a) [No change]

(b) to (d) [*Deleted*]

26.5 *Decision of the Receiving Office*

(a) The receiving Office shall decide whether the applicant has submitted the correction within the *time limit under Rule 26.2 and, if* the correction has been submitted within *that time limit,* whether the international application so corrected is or is not to be considered withdrawn *provided that no international application shall be considered withdrawn for lack of compliance with the physical requirements referred to in Rule 11 if it complies with those requirements to the extent necessary for the purpose of reasonably uniform international publication.*

(b) [*Deleted*]

26.6 [No change]

*The amendment consists of deleting, after the word "circumstances," the words "of the particular case."

**The amendment consists of deleting, after the word "month," the words "and normally not more than 2 months."

Rule 28
Defects Noted by the International Bureau*

28.1 Note on Certain Defects

(a) If, in the opinion of the International Bureau**, the international application contains any of the defects referred to in Article 14(1)(a)(i), (ii) or (v), the International Bureau*** shall bring such defects to the attention of the receiving Office.

(b) [No change]

*The amendment consists of deleting, after the word "Bureau," the words "or the International Searching Authority."

**The amendment consists of deleting, after the word "Bureau," the words "or of the International Searching Authority."

***The amendment consists of deleting, after the word "Bureau," the words "or the International Searching Authority, respectively."

Rule 29
International Applications or Designations Considered Withdrawn under Article 14(1), (3) or (4)

29.1 [No change]

29.2 Finding by Designated Office
[*Deleted*]

29.3 and 29.4 [No change]

Rule 32
Withdrawal of the International Application or of Designations

32.1 Withdrawals
(a) and (b) [No change]
(c) Withdrawal shall be effected by a signed notice from the applicant to the International Bureau or* to the receiving Office. In the case of Rule 4.8(b), the notice shall require the signature of all the applicants.
(d) *[Deleted]*
(e) *There shall be no international publication of the international application or of the designation, as the case may be, if the notice effecting withdrawal reaches the International Bureau before the technical preparations for publication have been completed.*

Rule 32bis
Withdrawal of the Priority Claim

32*bis*.1 Withdrawals

(a) and (b) [No change]

(c) Where the withdrawal of the priority claim, or, in the case of more than one such claim, the withdrawal of any of them, causes a change in the priority date of the international application, any time limit which is computed from the original priority date and which has not already expired shall be computed from the priority date resulting from that change. In the case of the time limit of 18 months referred to in Article 21(2)(a), the International Bureau may nevertheless proceed with the international publication on the basis of the said time limit as computed from the original priority date if the *notice effecting* withdrawal *reaches the International Bureau* during the period of 15 days preceding the expiration of that time limit.

(d) For any withdrawal under paragraph (a), the provisions of Rule 32.1(c)** shall apply *mutatis mutandis*.

*The amendment consists of deleting, after the word "or," the following words: ", if the record copy has not yet been sent to the International Bureau."

**The amendment also consists of deleting, after the words "Rule 32.1(c)," the words "and (d) and Rule 74bis.1."

Rule 34
Minimum Documentation

34.1 Definition

(a) and (b) [No change]

(c) Subject to paragraphs (d) and (e), the "national patent documents" shall be the following:

(i) to (v) [No change]

(vi) such patents issued by, and such patent applications published in, any other country after 1920 as are in the English, French, German or Spanish languages and in which no priority is claimed, provided that the national Office of the interested country sorts out these documents and places them at the disposal of each International Searching Authority.

(d) [No change]

(e) Any International Searching Authority whose official language, or one of whose official languages is not Japanese, Russian or Spanish is entitled not to include in its documentation those patent documents of Japan and the Soviet Union *as well as those patent documents in the Spanish language,* respectively, for which no abstracts in the English language are generally available. English abstracts becoming generally available after the date of entry into force of these Regulations shall require the inclusion of the patent documents to which the abstracts refer no later than 6 months after such abstracts become generally available. In case of the interruption of abstracting services in English in technical fields in which English abstracts were formerly generally available, the Assembly shall take appropriate measures to provide for the prompt restoration of such services in the said fields.

(f) [No change]

Rule 42
Time Limit for International Search

42.1 Time Limit for International Search

The time limit for establishing the international search report or the declaration referred to in Article 17(2)(a) *shall be* 3 months from the receipt of the search copy by the International Searching Authority, or 9 months from the priority date, whichever time limit expires later.*

*The amendment also consists of deleting the last sentence of Rule 42.1.

Rule 46
Amendment of Claims Before the International Bureau

46.1 Time Limit
The time limit referred to in Article 19 shall be 2 months from the date of transmittal of the international search report to the International Bureau and to the applicant by the International Searching Authority or *16 months from the priority date, whichever time limit expires later, provided that any amendment made under Article 19 which is received by the International Bureau after the expiration of the applicable time limit shall be considered to have been received by the Bureau on the last day of that time limit if it reaches it before the technical preparations for international publication have been completed.*

46.2 Dating of Amendments
[*Deleted*]

46.3 Language of Amendments
If the international application has been filed in a language other than the language in which it is published*, any amendment made under Article 19 shall be** in the language *of publication.*

46.4 Statement
(a) The statement referred to in Article 19(1) shall be in the language in which the international application is published and shall not exceed 500 words if in the English language or if translated into that language. *The statement shall be identified as such by a heading, preferably by using the words "Statement under Article 19(1)" or their equivalent in the language of the statement.*
(b) The statement shall contain no *disparaging* comments on the international search report or the relevance of*** citations contained in that report. *Reference* to citations, *relevant to a given claim,* contained in the international search report *may be made only in connection with an amendment of that claim.*

46.5 Form of Amendments
(a) [No change]
(b) and (c) [*Deleted*]

*The amendment also consists of deleting, after the word "published," the words "by the International Bureau."
**The amendment also consists of deleting, after the word "be," the word "both."
***The amendment also consists of deleting, after the word "of," the word "the."

Rule 47
Communication to Designated Offices

47.1 Procedure
(a) [No change]
(b) Such communication shall be effected promptly after the international publication of the international application and, in any event, by the end of the 19th month after the priority date. *Any amendment received by the International Bureau within the time limit under Rule 46.1 which was not included in the communication shall be communicated promptly to the designated Offices by the International Bureau, and the latter shall notify the applicant accordingly.* •
(c) to (e) [No change]

47.2 and 47.3 [No change]

•The amendment also consists of deleting the last sentence of Rule 47.1(b).

Rule 48
International Publication

48.1 [No change]

48.2 Contents
(a) The pamphlet shall contain:
(i) to (v) [No change]
(vi) any statement filed under Article 19(1), unless the International Bureau finds that the statement does not comply with the provisions of Rule 46.4,
(vii) *any request for rectification referred to in the third sentence of Rule 91.1(f).*
(b) Subject to paragraph (c), the front page shall include:
(i) [No change]
(ii) a figure or figures where the international application contains drawings, *unless Rule 8.2(b) applies,*
(iii) [No change]
(c) to (f) [No change]
(g) If, at the time *of the completion of the technical preparations for international publication,* the international search report is not yet available (for example, because of publication on the request of the applicant as provided in Articles 21(2)(b) and 64(3)(c)(i)), the pamphlet shall contain, in place of the international search report, an indication to the effect that that report was not available and that either the pamphlet (then also including the international search report) will be republished or the international search report (when it becomes available) will be separately published.
(h) If, at the time *of the completion of the technical preparations for international publication,* the time limit for amending the claims under Article 19 has not expired, the pamphlet shall refer to that fact and indicate that, should the claims be amended under Article 19, then, promptly after such amendments, either the pamphlet (containing the claims as amended) will be republished or a statement reflecting all the amendments will be published. In the latter case, at least the front page and the claims shall be republished and, if a statement under Article 19(1) has been filed, that statement shall be published as well, unless the International Bureau finds that the statement does not comply with the provisions of Rule 46.4.
(i) [No change]

48.3 *Languages*
(a) If the international application is filed in English, French, German, Japanese, Russian *or Spanish,* that application shall be published in the language in which it was filed.
(b) If the international application is filed in a language other than English, French, German, Japanese, Russian or Spanish, that application shall be published in English translation. The translation shall be prepared under the responsibility of the International Searching Authority, which shall be obliged to have it ready in time to permit *international publication by the prescribed date, or, where Article 64(3)(b) applies, to permit the communication under Article 20 by the end of the 19th month after the priority date.* Notwithstanding Rule 16.1(a), the International Searching Authority may charge a fee for the translation to the applicant. The International Searching Authority shall give the applicant an opportunity to comment on the draft translation. The International Searching Authority shall fix a time limit reasonable under the circumstances of the case for such comments. If there is no time to take the comments of the applicant into account before the translation is communicated or if there is a difference of opinion between the applicant and the said Authority as to the correct translation, the applicant may send a copy of his comments, or what remains of them, to the International Bureau and each designated Office to which the translation was communicated. The International Bureau shall publish the essence of the comments together with the translation of the International Searching Authority or subsequently to the publication of such translation.
(c) If the international application is published in a language other than English, the international search report to the extent that it is published under Rule 48.2(a)(v), or the declaration referred to in Article 17(2)(a), *the title of the invention,* the abstract *and any text matter pertaining to the figure or figures accompanying the abstract* shall be published both in that language and in English. The translations shall be prepared under the responsibility of the International Bureau.

48.4 and 48.5 [No change]

48.6 Announcing of Certain Facts
(a) [No change]
(b) [*Deleted*]
(c) If the international application *or the designation of any designated State* is withdrawn *under Rule 32.1, or if the priority claim is withdrawn under Rule 32bis.1,* after *the technical preparations for* international publication *have been completed,* this fact shall be published in the Gazette.

Rule 49
Copy, Translation and Fee under Article 22

49.1 Notification
(a) [No change]
(a-bis) *Any Contracting State not requiring the furnishing, under Article 22, by the applicant of a copy of the international application (even though the communication of the copy of the international application by the International Bureau under Rule 47 has not taken place by the expiration of the time limit applicable under Article 22) shall notify the International Bureau accordingly.*
(a-ter) *Any Contracting State which, pursuant to Article 24(2), maintains, if it is a designated State, the effect provided for in Article 11(3) even though a copy of the international application is not furnished by the applicant by the expiration of the time limit applicable under Article 22 shall notify the International Bureau accordingly.*
(b) Any notification received by the International Bureau under *paragraphs (a), (a-bis) or (a-ter)* shall be promptly published by the International Bureau in the Gazette.
(c) [No change]

49.2 [No change]

49.3 Statements under Article 19; Indications under Rule 13bis.4
For the purpose of Article 22 and the present Rule, any statement made under Article 19(1) and any indication furnished under Rule 13*bis*.4 shall, *subject to Rule 49.5(c) and (h),* be considered part of the international application.

49.4 *Use of National Form*
No applicant shall be required to use a national form when performing the acts referred to in Article 22.

49.5 *Contents of and Physical Requirements for the Translation*
(a) *For the purposes of Article 22, the translation of the international application shall contain the description, the claims, any text matter of the drawings and the abstract. If required by the designated Office, the translation shall also, subject to paragraphs (b) and (e),*
(i) *contain the request,*
(ii) *if the claims have been amended under Article 19, contain both the claims as filed and the claims as amended, and*
(iii) *be accompanied by a copy of the drawings.*
(b) *Any designated Office requiring the furnishing of a translation of the request shall furnish copies of the request form in the language of the translation free of charge to the applicants. The form and contents of the request form in the language of the translation shall not be different from those of the request under Rules 3 and 4; in particular, the request form in the language of the translation shall not ask for any information that is not in the request as filed. The use of the request form in the language of the translation shall be optional.*
(c) *Where the applicant did not furnish a translation of any statement made under Article 19(1), the designated Office may disregard such statement.*
(d) *If any drawing contains text matter, the translation of that text matter shall be furnished either in the form of a copy of the original drawing with the translation pasted on the original text matter or in the form of a drawing executed anew.*
(e) *Any designated Office requiring under paragraph (a) the furnishing of a copy of the drawing shall, where the applicant failed to furnish such copy within the time limit applicable under Article 22,*
(i) *invite the applicant to furnish such copy within a time limit which shall be reasonable under the circumstances and shall be fixed in the invitation, or*
(ii) *disregard the said drawing if such invitation, on Feb. 3, 1984, is not compatible with the national law applied by that Office and as long as it continues to be not compatible with that law.*
(f) *The expression "Fig." does not require translation into any language.*
(g) *Where any copy of the drawings or any drawing executed anew which has been furnished under paragraph (d) or (e) does not comply with the physical requirements referred to in Rule 11, the designated Office may invite the applicant to correct the defect within a time limit which shall be reasonable under the circumstances and shall be fixed in the invitation.*
(h) *Where the applicant did not furnish a translation of any indication furnished under Rule 13bis.4, the designated Office shall invite the applicant to furnish such translation, if it deems it to be necessary, within a time limit which shall be reasonable under the circumstances and shall be fixed in the invitation.*
(i) *Information on any requirement and practice of designated Offices under the second sentence of paragraph (a) shall be published by the International Bureau in the Gazette.*
(j) *No designated Office shall require that the translation of the international application comply with physical requirements other than those prescribed for the international application as filed.*

Rule 51
Review by Designated Offices

51.1 to 51.3 [No change]

51.4 Notification to the International Bureau
[*Deleted*]

Rule 51bis
Certain National Requirements Allowed under Article 27(1), (2), (6) and (7)

51*bis*.1 *Certain National Requirements Allowed*

(a) *The documents referred to in Article 27(2)(ii), or the evidence referred to in Article 27(6), which the applicant may be required to furnish under the national law applicable by the designated Office include, in particular:*

(i) *any document relating to the identity of the inventor,*

(ii) *any document relating to any transfer or assignment of the right to the application,*

(iii) *any document containing an oath or declaration by the inventor alleging his inventorship,*

(iv) *any document containing a declaration by the applicant designating the inventor or alleging the right to the application,*

(v) *any document containing any proof of the right of the applicant to claim priority where he is different from the applicant having filed the earlier application the priority of which is claimed,*

(vi) *any evidence concerning non-prejudicial disclosures or exceptions to lack of novelty, such as disclosures resulting from abuse, disclosures at certain exhibitions and disclosures by the applicant during a certain period of time.*

(b) *The national law applicable by the designated Office may, in accordance with Article 27(7), require that*

(i) *the applicant be represented by an agent having the right to represent applicants before that Office and/or have an address in the designated State for the purpose of receiving notifications,*

(ii) *the agent, if any, representing the applicant be duly appointed by the applicant.*

(c) *The national law applicable by the designated Office may, in accordance with Article 27(1), require that the international application, the translation thereof or any document relating thereto be furnished in more than one copy.*

(d) *The national law applicable by the designated Office may, in accordance with Article 27(2)(ii), require that the translation of the international application furnished by the applicant under Article 22 be verified by the applicant or the person having translated the international application in a statement to the effect that, to the best of his knowledge, the translation is complete and faithful.*

51*bis*.2 *Opportunity to Comply with National Requirements*

(a) *Where any of the requirements referred to in Rule 51bis.1, or any other requirement of the national law applicable by the designated Office which that Office may apply under Article 27(1), (2), (6) or (7), is not already fulfilled during the same period within which the requirements under Article 22 must be complied with, the applicant shall have an opportunity to comply with the requirement after the expiration of that period.*

(b) *The national law applicable by the designated Office may, in accordance with Article 27(2)(ii), require that the applicant, upon invitation by the designated Office, furnish a certification of the translation of the international application by a public authority or a sworn translator, if the designated Office deems such certification to be necessary under the circumstances, within a time limit which shall be reasonable under the circumstances and shall be fixed in the invitation.*

(c) *If, on Feb. 3, 1984, paragraph (a) is, with respect to the requirements referred to in Rule 51bis.1 (a)(iii) and (vi), (b)(i) and (d), not compatible with the national law applied by the designated Office and as long as it continues to be not compatible with that law, the applicant shall have no opportunity to comply with any of the requirements after the expiration of the time limit applicable under Article 22. Information on such national laws shall be published by the International Bureau in the Gazette.*

Rule 53
The Demand

53.1 Form
(a) to (c) [No change]
(d) [*Deleted*]

53.2 to 53.8 [No change]

Rule 54
The Applicant Entitled to Make a Demand

54.1 and 54.2 [No change]

54.3 Several Applicants: Different for Different Elected States
(a) [No change]
(b) [*Deleted*]

54.4 *Applicant Not Entitled to Make a Demand or an Election*
(a) *If the applicant does not have the right or, in the case of several applicants, if none of them has the right to make a demand under Article 31(2), the demand shall be considered not to have been submitted.*
(b) *If the requirement under Rule 54.3(a) is not fulfilled in respect of any elected State, the election of that State shall be considered not to have been made.*

Rule 55
Languages (International Preliminary Examination)

55.1 The Demand
The demand shall be in the language of the international application or, *if the international application has been filed in a language other than the language in which it is published, in the language of publication.*

55.2 The International Application
[*Deleted*]

Rule 58
The Preliminary Examination Fee

58.1 and 58.2 [No change]

58.3 Refund

The International Preliminary Examining Authorities shall inform the International Bureau of the extent, if any, to which, and the conditions, if any, under which, they will refund any amount paid as a preliminary examination fee where the demand is considered as if it had not been submitted*, and the International Bureau shall promptly publish such information.

*The amendment consists of deleting, after the word "submitted," the words "under Rule 57.4(c), Rule 58.2(c) or Rule 60.1(c)."

Rule 60
Certain Defects in the Demand or Elections

60.1 and 60.2 [No change]

60.3 Attempted Elections
[*Deleted*]

Rule 61
Notification of the Demand and Elections

61.1 Notifications to the International Bureau, the Applicant, and the International Preliminary Examining Authority

(a) The International Preliminary Examining Authority shall indicate on* the demand the date of receipt or, where applicable, the date referred to in Rule 60.1(b). The International Preliminary Examining Authority shall promptly send the *demand*to the International Bureau, *and* shall *prepare and* keep *a* copy in its files.

(b) The International Preliminary Examining Authority shall promptly inform the applicant in writing of the date of receipt of the demand. Where the demand has been considered under Rules *54.4(a),* 57.4(c), 58.2(c) or 60.1(c) as if it had not been submitted *or where an election has been considered under Rule 54.4(b) as if it had not been made,* the International Preliminary Examining Authority shall notify the applicant *and the International Bureau* accordingly.

(c) [No change]

61.2 and 61.3 [No change]

*The amendment consists of deleting, after the word "on," the words "both copies of."

Rule 62
Copy for the International Preliminary Examining Authority

62.1 The International Application
[*Deleted*]

62.2 [No change]

Rule 66
Procedure Before the International Preliminary Examining Authority

66.1 [No change]

66.2 First Written Opinion of the International Preliminary Examining Authority
(a) If the International Preliminary Examining Authority
(i) considers that the international application has any of the defects described in Article 34(4).
(ii) considers that the international preliminary examination report should be negative in respect of any of the claims because the invention claimed therein does not appear to be novel, does not appear to involve an inventive step (does not appear to be non-obvious), or does not appear to be industrially applicable,
(iii) notices that there is some defect in the form of contents of the international application under the Treaty or these Regulations,
(iv) considers that any amendment goes beyond the disclosure in the international application as filed, or
(v) wishes to accompany the international preliminary examination report by observations on the clarity of the claims, the description, and the drawings, or the question whether the claims are fully supported by the description,
the said Authority shall notify the applicant accordingly in writing. *Where the national law of the national Office acting as International Preliminary Examining Authority does not allow multiple dependent claims to be drafted in a manner different from that provided for in the second and third sentences of Rule 6.4(a), the International Preliminary Examining Authority may, in case of failure to use that manner of claiming, apply Article 34(4)(b). In such case, it shall notify the applicant accordingly in writing.*
(b) [No change]
(c) The notification shall invite the applicant to submit a written reply together, where appropriate, with amendments*.
(d) [No change]

66.3 Formal Response to the International Preliminary Examining Authority
(a) The applicant may respond to the invitation referred to in Rule 66.2(c) of the International Preliminary Examining Authority by making amendments* or—if he disagrees with the opinion of that Authority—by submitting arguments, as the case may be, or do both.
(b) [No change]

66.4 Additional Opportunity for *Submitting Amendments or Arguments*
(a) [No change]
(b) On the request of the applicant, the International Preliminary Examining Authority may give him one or more additional opportunities to submit amendments or *arguments.*

66.5 Amendment
Any change, other than the rectification of obvious errors**, in the claims, the description, or the drawings, including cancellation of claims, omission of passages in the description, or omission of certain drawings, shall be considered an amendment.

66.6 [No change]

66.7 Priority Document
(a) If the International Preliminary Examining Authority needs a copy of the application whose priority is claimed in the international application, the International Bureau shall, on request, promptly furnish such copy. *If that copy is not furnished to the International Preliminary Examining Authority because the applicant failed to comply with the requirements of Rule 17.1, the international preliminary examination report may be established as if the priority had not been claimed.*
(b) If the application whose priority is claimed *in the international application* is in a language other than the language or one of the languages of the International Preliminary Examining Authority, *that Authority may invite the applicant to furnish* a translation in the said language or one of the said languages *within 2 months from the date of the invitation. If the translation is not furnished within that time limit, the international preliminary examination report may be established as if the priority had not been claimed.*
(c) [*Deleted*]

66.8 Form of*** Amendments
(a) The applicant shall be required to submit a replacement sheet for every sheet of the international application which, on account of **** an amendment, differs from the sheet originally filed. The letter accompanying the replacement sheets shall draw attention to the differences between the replaced sheets and the replacement sheets. To the extent that any amendment results in the cancellation of an entire sheet, that amendment shall be communicated in a letter.
(b) [*Deleted*]

66.9 *Language of Amendments*
If the international application has been filed in a language other than the language in which it is published, any amendment, as well as any letter referred to in Rule 66.8(a), shall be submitted in the language of publication.

---

*The amendment consists of deleting, after the word "amendments," the words "or corrections."
**The amendment consists of deleting, after the word "errors," the words "of transcription."
***The amendment consists of deleting, after the word "of," the words "Corrections and."
****The amendment consists of replacing, after the word "of," the words "a correction or" by the word "an."

Rule 69
Time Limit for International Preliminary Examination

69.1 Time Limit for International Preliminary Examination

(a) *The time limit for establishing the international preliminary examination report shall be:*

(i) *28 months from the priority date if the demand was filed prior to the expiration of 19 months from the priority date;*

(ii) *9 months from the start of the international preliminary examination if the demand was filed after the expiration of 19 months from the priority date.*

(b) and (c) [No change]

Rule 70
The International Preliminary Examination Report

70.1 [No change]

70.2 Basis of the Report
(a) [No change]
(b) If, pursuant to Rule *66.7(a) or (b),* the report is established as if the priority had not been claimed, the report shall so indicate.
(c) [No change]

70.3 to 70.10 [No change]

70.11 Mention of Amendments*
If, before the International Preliminary Examining Authority, amendments* have been made, this fact shall be indicated in the report. *Where any amendment has resulted in the cancellation of an entire sheet, this fact shall also be specified in the report.*

70.12 to 70.15 [No change]

70.16 Annexes of the Report
If the claims, the description, or the drawings, were amended** before the International Preliminary Examining Authority, each replacement sheet *under Rule 66.8(a)* shall be *annexed* to the report.*** Replacement sheets superseded by later replacement sheets *and letters under Rule 66.8(a)* shall not be annexed.****

70.17 Languages of the Report and the Annexes
(a) The report *and any annex* shall be in the language in which the international application to which *they relate* is published.
(b) [*Deleted*]

*The amendment consists of deleting, in the title, after the word "Amendments," the words "or Correction of Certain Defects" and, in the Rule itself, after the word "amendments," the words "or corrections."
**The amendment also consists of deleting, after the word "amended", the words "or any part of the international application was corrected."
***The amendment also consists of deleting, after the word "report," the words "as an annex thereto."
****The amendment also consists of deleting the last sentence of Rule 70.16.

Rule 74
Translations of Annexes of the International Examination Report and Transmittal Thereof

74.1 *Contents of Translation and* Time Limit *for Transmittal Thereof*
Where the furnishing of a translation of the international application is required by the elected Office under Article 39(1), the applicant shall, within the time limit applicable under Article 39(1), transmit a translation of any replacement sheet referred to in Rule 70.16 which is annexed to the international preliminary examination report. The same time limit shall apply where the furnishing of a translation of the international application to the elected Office must, because of a declaration made under Article 64(2)(a)(i), be effected within the time limit applicable under Article 22.

Rule 74bis
Notification of Withdrawal under Rule 32

74*bis*.1 Notification of the International Preliminary Examining Authority
[*Deleted*]

Rule 75
Withdrawal of the Demand, or of Elections

75.1 Withdrawals
(a) Withdrawal of the demand or all the elections may be effected prior to the expiration of *30* months from the priority date except as to any elected State in which national processing or examination has already started. Withdrawal of the election of any elected State may be effected prior to the date on which examination and processing may start in that State.
(b) [No change]

75.2 Notification of Elected Offices
[*Deleted*]

75.3 Notification of the International Preliminary Examining Authority
[*Deleted*]

75.4 [No change]

Rule 76
Copy, Translation and Fee under Article 39(1); Translation of Priority Document

76.1 Notification
[*Deleted*]

76.2 Languages
[*Deleted*]

76.3 Statements under Article 19; Indications under Rule 13bis.4
[*Deleted*]

76.4 [No change]

76.5 *Application of Rules 22.1(g), 49 and 51bis*
Rules 22.1(g), 49 and 51bis shall apply, provided that:
(i) *any reference in the said Rules to the designated Office or to the designated State shall be construed as a reference to the elected Office or to the elected State, respectively;*
(ii) *any reference in the said Rules to Article 22 shall be construed as a reference to Article 39(1);*
(iii) *the words "international applications filed" in Rule 49.1(c) shall be replaced by the words "a demand submitted."*

Rule 80
Computation of Time Limits

80.1 to 80.5 [No change]

80.6 Date of Documents
(a) [No change]
(b) [*Deleted*]

80.7 [No change]

Rule 82
Irregularities in the Mail Service

82.1 Delay or Loss in Mail

(a) and (b) [No change]

(c) In the cases provided for in paragraph (b), evidence of mailing within the prescribed time limit, and, where the document or letter was lost, the substitute document or letter as well *as the evidence concerning its identity with the document or letter lost* shall be submitted within 1 month after the date on which the interested party noticed—or with due diligence should have noticed—the delay or the loss, and in no case later than 6 months after the expiration of the time limit applicable in the given case.

82.2 [No change]

Rule 82bis

Excuse by the Designated or Elected State of Delays in Meeting Certain Time Limits

82*bis*.1 *Meaning of "Time Limit" in Article 48(2)*

The reference to "any time limit" in Article 48(2) shall be construed as comprising a reference:

(i) *to any time limit fixed in the Treaty or these Regulations;*

(ii) *to any time limit fixed by the receiving Office, the International Searching Authority, the International Preliminary Examining Authority or the International Bureau or applicable by the receiving Office under its national law;*

(iii) *to any time limit fixed by, or in the national law applicable by, the designated or elected Office, for the performance of any act by the applicant before that Office.*

82*bis*.2 *Reinstatement of Rights and Other Provisions to which Article 48(2) Applies*

The provisions of the national law which is referred to in Article 48(2) concerning the excusing, by the designated or elected State, of any delay in meeting any time limit are those provisions which provide for reinstatement of rights, restoration, *restitutio in integrum* or further processing in spite of non-compliance with a time limit, and any other provision providing for the extension of time limits or for excusing delays in meeting time limits.

Rule 82ter
Rectification of Errors Made by the Receiving Office or by the International Bureau

82*ter*.1 *Errors Concerning the International Filing Date and the Priority Claim*

If the applicant proves to the satisfaction of any designated or elected Office that the international filing date is incorrect due to an error made by the receiving Office or that the declaration made under Article 8(1) has been erroneously cancelled or corrected by the receiving Office or the International Bureau, and if the error is an error such that, had it been made by the designated or elected Office itself, that Office would rectify it under the national law or national practice, the said Office shall rectify the error and shall treat the international application as if it had been accorded the rectified international filing date or as if the declaration under Article 8(1) had not been cancelled or corrected, as the case may be.

Rule 88
Amendment of the Regulations

88.1 [No change]

88.2 Requirement of Unanimity During a Transitional Period
[*Deleted*]

88.3 [No change]

88.4 Procedure
Any proposal for amending a provision referred to in Rules 88.1* or 88.3 shall, if the proposal is to be decided upon in the Assembly, be communicated to all Contracting States at least 2 months prior to the opening of that session of the Assembly which is called upon to make a decision on the proposal.

*The amendment consists of deleting, after the expression "Rule 88.1," the expression "88.2."

Rule 90
Representation

90.1 and 90.2 [No change]

90.3 Appointment

(a) and (b) [No change]

(c) If the separate power of attorney is not signed*, or if the required separate power of attorney is missing, or if the indication of the name or address of the appointed person does not comply with Rule 4.4, the power of attorney shall be considered non-existent unless the defect is corrected.

(d) [No change]

90.4 [No change]

*The amendment consists of deleting, after the word "signed," the words "as provided in paragraph (a)."

Rule 91
Obvious Errors in Documents

91.1 Rectification

(a) Subject to paragraphs (b) to *(g-quater)*, obvious errors* in the international application or other papers submitted by the applicant may be rectified.

(b) Errors which are due to the fact that something other than what was obviously intended was written in the international application or other paper shall be regarded as obvious errors*. The rectification itself shall be obvious in the sense that anyone would immediately realize that nothing else could have been intended than what is offered as rectification.

(c) [No change]

(d) Rectification may be made on the request of the applicant. The authority having discovered what appears to be an obvious error** may invite the applicant to present a request for rectification as provided in paragraphs (e) to *(g-quater). Rule 26.4(a) shall apply mutatis mutandis to the manner in which rectifications shall be requested.*

(e) [No change]

(f) *Any authority which authorizes or refuses any rectification shall promptly notify the applicant of the authorization or refusal and, in the case of refusal, of the reasons therefor. The authority which authorizes a rectification shall promptly notify the International Bureau accordingly. Where the authorization of the rectification was refused, the International Bureau shall, upon request made by the applicant prior to the time relevant under paragraph (g-bis), (g-ter) or (g-quater) and subject to the payment of a special fee whose amount shall be fixed in the Administrative Instructions, publish the request for rectification together with the international application. A copy of the request for rectification shall be included in the communication under Article 20 where a copy of the pamphlet is not used for that communication or where the international application is not published by virtue of Article 64(3).*

(g) The authorization for rectification referred to in paragraph (e) shall, subject to paragraphs (g-bis), (g-ter) and (g-quater), be effective:

(i) *where it is given by the receiving Office or by the International Searching Authority, if its notification to the International Bureau reaches that Bureau before the expiration of 17 months from the priority date;*

(ii) *where it is given by the International Preliminary Examining Authority, if it is given before the establishment of the international preliminary examination report;*

(iii) *where it is given by the International Bureau, if it is given before the expiration of 17 months from the priority date.*

(g-bis) If the notification made under paragraph (g)(i) reaches the International Bureau, or if the rectification made under paragraph (g)(iii) is authorized by the International Bureau, after the expiration of 17 months from the priority date but before the technical preparations for international publication have been completed, the authorization shall be effective and the rectification shall be incorporated in the said publication.

(g-ter) Where the applicant has asked the International Bureau to publish his international application before the expiration of 18 months from the priority date, any notification made under paragraph (g)(i) must reach, and any rectification made under paragraph (g)(iii) must be authorized by, the International Bureau, in order for the authorization to be effective, not later than at the time of the completion of the technical preparations for international publication.

(g-quater) Where the international application is not published by virtue of Article 64(3), any notification made under paragraph (g)(i) must reach, and any rectification made under paragraph (g)(iii) must be authorized by, the International Bureau, in order for the authorization to be effective, not later than at the time of the communication of the international application under Article 20.

(h) [*Deleted*]

91.2 Manner of Carrying Out Rectifications

[*Deleted*]

*The amendment consists of deleting, after the word "errors," the words "of transcription."
**The amendment consists of deleting, after the word "error," the words "of transcription."

Rule 92
Correspondence

92.1 [No change]

92.2 Languages

(a) Subject to *Rules 55.1 and 66.9 and to paragraph (b) of this Rule,* any letter or document submitted by the applicant to the International Searching Authority or the International Preliminary Examining Authority shall be in the same language as the international application to which it relates.

(b) [No change]

(c) [*Deleted*]

(d) and (e) [No change]

92.3 and 92.4 [No change]

Rule 92bis
Recording of Changes in Certain Indications in the Request or the Demand

92*bis*.1 Recording of Changes by the International Bureau

(a) The International Bureau shall, on the request of the applicant or the receiving Office, record changes in the following indications appearing in the request or demand:

(i) person, name, residence, nationality or address of the applicant,

(ii) person, name or address of the agent, the common representative or the inventor.

(b) *The International Bureau shall not record the requested change if the request for recording is received by it after the expiration:*

(i) *of the time limit referred to in Article 22(1), where Article 39(1) is not applicable with respect to any Contracting State;*

(ii) *of the time limit referred to in Article 39(1)(a), where Article 39(1) is applicable with respect to at least one Contracting State.*

92*bis*.2 Notifications

[*Deleted*]

PATENT NOTICES

Certificates of Correction for the Week of Apr. 16, 1983

Re. 31,570	4,452,837	4,471,716	4,478,753
3,455,675	4,452,954	4,472,270	4,478,883
4,139,619	4,452,984	4,472,416	4,478,970
4,172,140	4,454,217	4,472,519	4,479,042
4,254,823	4,455,298	4,472,695	4,479,067
4,258,931	4,455,464	4,472,842	4,479,245
4,291,037	4,456,201	4,473,185	4,479,328
4,360,522	4,458,691	4,473,277	4,479,528
4,369,222	4,459,171	4,473,412	4,480,160
4,375,083	4,459,543	4,474,102	4,480,180
4,379,454	4,460,097	4,474,120	4,480,243
4,379,759	4,460,241	4,474,187	4,480,531
4,386,912	4,460,387	4,474,247	4,480,913
4,389,542	4,460,493	4,474,269	4,480,934
4,393,405	4,460,911	4,474,311	4,481,144
4,397,000	4,462,069	4,474,367	4,481,194
4,404,926	4,462,080	4,474,493	4,481,411
4,405,031	4,462,700	4,474,524	4,481,588
4,407,045	4,463,000	4,474,743	4,482,015
4,407,951	4,463,044	4,475,276	4,482,026
4,409,678	4,463,764	4,475,278	4,482,113
4,410,430	4,463,813	4,475,324	4,482,158
4,413,022	4,464,358	4,475,876	4,482,498
4,413,715	4,464,618	4,475,913	4,482,561
4,415,780	4,465,591	4,476,045	4,482,922
4,416,673	4,465,732	4,476,104	4,483,009
4,419,402	4,465,779	4,476,144	4,483,242
4,421,729	4,465,834	4,476,180	4,483,334
4,422,641	4,466,169	4,476,298	4,483,728
4,423,648	4,466,417	4,476,792	4,483,893
4,424,465	4,466,746	4,476,858	4,483,951
4,428,086	4,466,952	4,476,880	4,484,270
4,429,375	4,467,633	4,476,946	4,484,926
4,432,746	4,467,757	4,477,239	4,485,024
4,433,833	4,467,830	4,477,244	4,485,100
4,438,116	4,467,865	4,477,337	4,487,091
4,441,189	4,467,880	4,477,401	4,487,995
4,441,825	4,468,092	4,477,551	4,488,559
4,441,847	4,468,169	4,477,579	4,488,647
4,443,333	4,468,344	4,477,869	4,489,971
4,443,513	4,469,663	4,478,140	4,490,138
4,443,794	4,469,720	4,478,206	4,490,491
4,444,933	4,470,070	4,478,269	4,490,653
4,445,334	4,470,446	4,478,329	4,490,718
4,447,357	4,470,763	4,478,423	4,490,880
4,447,738	4,471,355	4,478,468	4,491,090
4,449,810	4,471,481	4,478,621	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4277
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF March 2, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	6-20-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-06-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	8-10-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	9-30-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	7-20-81
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	7-19-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-20-82
DESIGN, GROUP 290—K. L. CAGE, Director	11-08-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	10-28-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	3-22-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-30-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-25-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-21-83

Expiration of patents: The patents within the range of numbers indicated below expire during March 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,371,351 to 3,375,528, inclusive

Plant Patents . . . . . Numbers 2,797 to 2,801 inclusive

REEXAMINATIONS

APRIL 16, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 2,978,437 (334th)

WATER-INSOLUBLE CONDENSATION PRODUCTS OF ALDEHYDES AND ACRYLAMIDE INTERPOLYMERS

Roger M. Christenson, Richland Township, Allegheny County, Pa., assignor to Pittsburgh Plate Glass Company, Allegheny County, Pa.

Reexamination Request No. 90/000,467, Nov. 14, 1983.

Reexamination Certificate for Patent No. 2,978,437, issued Apr. 4, 1961, Ser. No. 665,109, Jun. 12, 1957.

Continuation-in-part of Ser. No. 562,595, Jan. 31, 1956, abandoned.

Int. Cl.[3] **C08L** *63/02, 61/20*

U.S. Cl. 525—163

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–11** is confirmed.

1. A resinous composition which is insoluble in water, and which comprises an interpolymer of (A) an amide selected from the group consisting of acrylamide, methacrylamide and itaconic diamide, (B) a monoethylenically unsaturated aliphatic carboxylic acid consisting of atoms of carbon, hydrogen and oxygen, and (C) at least one other monomer containing a $C{=}CH_2$ group, said interpolymer containing about 5 to about 50 percent by weight of said amide based upon the total weight of said interpolymer, and about 1 to about 30 percent upon a like basis of said monoethylenically unsaturated aliphatic carboxylic acid, said interpolymer being characterized by having amido hydrogen atoms replaced by the structure

wherein R is a member selected from the group consisting of hydrogen, furyl and a saturated lower aliphatic hydrocarbon radical and R_1 is a member selected from the group consisting of hydrogen, lower alkyl and butoxyethyl, said monoethylenically unsaturated aliphatic carboxylic acid functioning as an internal curing catalyst in said resinous composition.

B1 3,037,963 (335th)

RESINOUS MATERIALS

Roger M. Christenson, Richland Township, Allegheny County, Pa., assignor to Pittsburgh Plate Glass Company, Allegheny County, Pa.

Reexamination Request No. 90/000,468, Nov. 14, 1983.

Reexamination Certificate for Patent No. 3,037,963, issued Jun. 5, 1962, Ser. No. 749,583, Jul. 21, 1958.

Continuation-in-part of Ser. No. 584,473, May 14, 1956, which is a continuation-in-part of Ser. No. 490,409, Feb. 24, 1955, abandoned.

Int. Cl.[3] **C08F** *8/28;* **C08L** *61/20*

U.S. Cl. 525—154

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–15** is confirmed.

1. A thermosetting, ungelled, water insoluble resinous composition comprising an interpolymer of monomers consisting essentially of an unsaturated amide selected from the class consisting of acrylamide, methacrylamide, itaconic diamide, maleuric acid, alkyl esters of maleuric acid and N-carbamyl maleimide, with at least one other monomer containing a terminal $CH_2{=}C<$ group, said interpolymer containing from about 5 percent to 50 percent of said amide, substantially all of the nitrogen atoms in said interpolymer being trivalent nitrogen atoms, said interpolymer being characterized by having at least about 50 percent of the amido groups thereof having a hydrogen atom replaced by the structure

wherein R is a member of the class consisting of hydrogen, furyl, and a saturated lower aliphatic hydrocarbon radical, and R_1 is a member of the class consisting of alkyl radicals containing from about 1 to 12 carbon atoms, and benzyl radicals.

B1 3,527,969 (336th)

SOUNDPROOFED HOUSING FOR ELECTRIC MOTORS

Hermann Papst, Saint Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren KG, Saint Georgen, Fed. Rep. of Germany

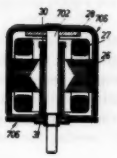
Reexamination Request No. 90/000,522, Mar. 7, 1984.

Reexamination Certificate for Patent No. 3,527,969, issued Sep. 8, 1970, Ser. No. 773,976, Oct. 28, 1968.

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1967, 1,613,343

Int. Cl.[3] **H02K** *5/02, 5/24, 5/14*

U.S. Cl. 310—51



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–18** are cancelled.

New claims **19–37** are added and determined to be patentable.

19. An external-rotor motor having an improved motor housing, the motor comprising an internal, wound stator and an external, non-wound rotor, the stator and rotor together defining a generally cylindrical air gap, the improved motor housing comprising

a rotatable, cupped main body portion forming part of the rotor and having an open end,

a stationary, generally disk-like cover portion secured to the stator and positioned at said open end,

the cupped main body portion and the cover portion each comprising at least one respective layer of a flux-conducting ferromagnetic material through which pass magnetic lines of force of the magnetic field produced by the wound stator,

nearly all magnetic force lines of the magentic field produced by the wound stator passing generally radially through said air gap and thus through the layer of flux-conducting ferromagnetic material of the cupped main body portion, stray lines of

magnetic force accordingly passing through the layer of flux-conducting ferromagnetic material of the cover portion,

at least one of said portions of the motor housing comprising a plural-layer sandwich which includes two layers of metallic material of which one is said respective layer of a flux-conducting ferromagnetic material, and a liner of soundproofing material sandwiched between the layers of metallic material.

B1 3,654,638 (337th)

OUTPUT COMMODE PAN

Alice W. Nye, 7534 Greendows, Houston, Tex. 77017

Reexamination Request No. 90/000,316, Jan. 14, 1983.

Reexamination Certificate for Patent No. 3,654,638, issued Apr. 11, 1972, Ser. No. 885,811, Dec. 17, 1969.

Continuation-in-part of Ser. No. 828,307, May 27, 1969, abandoned.

Int. Cl.³ A47K *11/00*

U.S. Cl. 4—144.1

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** is confirmed.

New claims **5–10** are added and determined to be patentable.

1. A receptacle for waste matter discharged from the body for use in association with a toilet bowl comprising:

a. a hollow open topped receptacle of generally semi-elliptical shape for fitting within and selectively covering only that portion of the toilet bowl in which said receptacle is positioned while leaving the remainder of the toilet bowl uncovered;

b. said semi-elliptical shaped container including flange means for resting upon the rim of the toilet bowl,

c. said flange means having surfaces thereon to thereby be clamped between the toilet bowl rim and seat when the receptacle is in use, and

d. said receptacle including a chamber therein formed by walls depending from said rim and connected with a bottom wall that extends in a plane transversely relative to the toilet bowl opening.

B1 3,963,842 (338th)

DEPOSITION OF COPPER

Christian Sivertz, London, Canada, and Anthony J. Basilone, Guilford, Conn., assignors to London Laboratories Limited Co., Woodbridge, Conn.

Reexamination Request No. 90/000,286, Nov. 10, 1982.

Reexamination Certificate for Patent No. 3,963,842, issued Jun. 15, 1976, Ser. No. 521,338, Nov. 6, 1974.

Continuation-in-part of Ser. No. 481,332, Jun. 20, 1974, abandoned.

Int. Cl.³ C23C *3/02*

U.S. Cl. 427—305

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–13** are cancelled.

[1. In a process for the deposition of metallic copper on a catalytically activated surface by disproportionation of cuprous ions in an aqueous solution to effect deposition of metallic copper on said surface, the improvement which comprises rapidly reducing cupric tetraamino ions in aqueous solution substantially completely to cuprous diammino ions and thereafter effecting controlled disproportionation of the resultant cuprous ions by adding an activator-modifier, which activator-modifier brings about the deposition of metallic copper principally on said catalytically activated surface.**]**

[11. In a process for the deposition of metallic copper on a catalytically activated surface by disproportionation of cuprous ions in an aqueous solution to effect deposition of metallic copper on said surface, the improvement which comprises effecting controlled disproportionation of the cuprous ions by adding an activator-modifier which activator-modifier brings about the deposition of metallic copper principally on said catalytically activated surface.

a. a chelating amine selected from the group consisting of ethylene diammine, triethylene tetraammine, and analogous alkylamines, or

b. a suitable acid or salt selected from the group consisting of sulfamic acid, hydroxy-carboxylic acids, carboxylic acids, and combinations thereof; or

c. an acid activator selected from the group consisting of sulfuric and phosphoric acids used with modifiers selected from the group consisting of said suitable acids or salts, said chelating amines, and combinations thereof.**]**

[12. In a process for the deposition of metallic copper on a catalytically activated surface by disproportionation of cuprous ions in an aqueous solution to effect deposition of metallic copper on said surface, the improvement which comprises rapidly reducing cupric tetraammino ions in aqueous solution substantially completely to cuprous diammino ions and effecting disproportionation of the resulting cuprous ions to bring about the deposition of metallic copper principally on said catalytically activated surface.**]**

B1 4,316,579 (339th)

MULTI-PURPOSE SEAL FOR POP-UP SPRINKLER

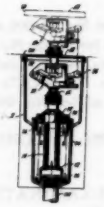
Charles A. Ray, Arcadia, and John L. Kent, Ontario, both of Calif., assignors to Anthony Manufacturing Company, Azusa, Calif.

Reexamination Request No. 90/000,592, Jul. 12, 1984.

Reexamination Certificate for Patent No. 4,316,579, issued Feb. 23, 1982, Ser. No. 138,868, Apr. 11, 1980.

Int. Cl.³ B05B *15/10*

U.S. Cl. 239—123



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–8** and **18–22** is confirmed.

Claim **9** is determined to be patentable as amended.

Claims 10–17, dependent on an amended claim, are determined to be patentable.

9. A seal to be interposed between a moveable stem and a stationary housing in a pop-up type irrigation sprinkler, said seal assuming a fixed position with respect to said housing; said seal comprising:

means adjacent one end of said seal for wiping grit from an exterior surface of said stem during movement of said stem in a first direction;

a bearing adjacent said grit wiping means and arranged to slidingly engage said exterior surface of said stem; and

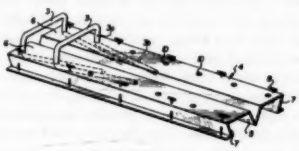
pressure-responsive means adjacent the opposite end of said seal for slidingly engaging said exterior surface of said stem and providing a seal between said stem and said housing during movement of said stem in a second, opposite direction.

B1 4,338,757 (340th)

DEVICE FOR CONNECTING A STRUCTURE WITH A WALL TO BE POURED WITH CONCRETE

Heinz Witschi, Eigerweg 14, 3073 Gümligen, Berne, and Peter Fankhauser, Sonnrainstrasse 13, 3510 Konolfingen, Berne, both of Switzerland

Reexamination Request No. 90/000,393, Jun. 10, 1983.
Reexamination Certificate for Patent No. 4,338,757, issued Jul. 13, 1982, Ser. No. 140,782, Apr. 16, 1980.
Claims priority, application Switzerland, May 1, 1979, 4073/79
Int. Cl.³ E04B *1/38*
U.S. Cl. 52—699



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is cancelled.

Claims 2, 4–6 and 11 are determined to be patentable as amended.

Claims 3, 7–10 and 12–15, dependent on an amended claim, are determined to be patentable.

New claims 16–21 are added and determined to be patentable.

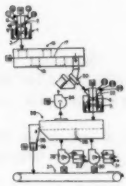
16. A device for connecting two poured concrete structures, such as a partition, a staircase or a false floor with a wall to be poured with concrete in a planking, said device comprising at least one profile element comprising a malleable sheet the surface of which is provided with roughening means for optimizing adhesion of said sheet with said concrete structures, said profile element having two side walls with laterally projecting flanges and at least one bottom connected with said two side walls to form a channel-shaped strip, each of said side walls enclosing an acute angle with said bottom, at least one anchoring steel rod extended through said bottom such that a first portion of said rod to be concreted with a first one of said two concrete structures is disposed on one side of said profile element and a second portion of said rod to be concreted with the second of said two concrete structures is disposed on the other side of said profile element, said second portion having a bend at a substantially right angle from said first portion such that said second rod portion lies against the bottom of said profile element confined by said side walls, said second rod portion being adapted to be bent outwardly away from said bottom for concreting with said second concrete structure, said profile element being fitted to the inside wall of said planking such that said side walls bear on the planking and form a cavity between said bottom and said planking, the length of said second rod portion being greater than the distance between said bottom and said planking.

B1 4,427,417 (341st)

PROCESS FOR PREPARING DETERGENT COMPOSITIONS CONTAINING HYDRATED INORGANIC SALTS

Paul A. Porasik, Southfield, Mich., assignor to The Korex Company, Wixom, Mich.

Reexamination Request No. 90/000,574, Jun. 13, 1984.
Reexamination Certificate for Patent No. 4,427,417, issued Jan. 24, 1984, Ser. No. 341,130, Jan. 20, 1982.
Int. Cl.³ B01J *2/10, 2/16;* C11D *11/00, 17/06*
U.S. Cl. 23—313 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–17 is confirmed.

1. A continuous process for agglomerating and hydrating an anhydrous hydratable detergent salt which comprises continuously feeding and agglomerating particles of a hydratable detergent salt by turbulently dispersing said salt particles into an inert gaseous medium while wetting the dispersed particles with an atomized stream of water metered to provide at least a stoichiometric amount of water but not in excess of about 20% over said stoichiometric amount for hydration of the turbulently dispersed salt particles, depositing the resultant wet agglomerated salt particles into a closed container, retaining the agglomerated particles in said container until they have been substantially hydrated to a degree of hydration between 70% and 100% of theoretical while continuously gently stirring the agglomerates to prevent formation of oversize agglomerates, discharging the substantially hydrated agglomerates from said container and then drying the hydrated agglomerates to a free moisture content less than 5 percent by weight.

REISSUES

APRIL 16, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,865
ARTIFICIAL JOINTS, IN PARTICULAR COXO-FEMORAL JOINTS

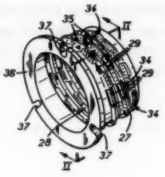
Christiane Roux, Noisy sur Ecole, 77123 Le Vaudoue, Seine-et-Marne, France

Original No. 4,262,369, dated Apr. 21, 1981, Ser. No. 49,905, Jun. 19, 1979. Application for reissue Apr. 18, 1983, Ser. No. 486,037

Claims priority, application France, Jun. 21, 1978, 78 18619

Int. Cl.³ A61F *1/03*

U.S. Cl. 3—1.912 **24 Claims**



24. An articular prosthesis for an artificial joint comprising two distinct parts, including an inner cupule and an outer ring, said inner cupule being received on said outer ring, said outer ring being provided with at least one external self-tapping thread, and with an inner collecting volume, which is at least partly formed within the inner volume of said outer ring, between said outer ring and said inner cupule, and which opens to the outside, at spaced locations, through openings in said self-tapping thread, said collecting volume being adapted to receive bone chips, the outer ring internally comprises a helical groove which forms a hollow complementary to said self-tapping thread, said groove following the contour of said thread and being at least partly formed in the thickness thereof, said collecting volume being at least partly formed by said helical groove.

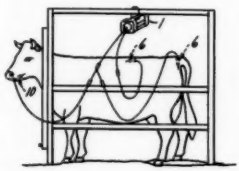
Re. 31,866
IMMOBILIZING ANIMALS

Lancelot H. Lines, Mount Bryan, and John R. Baxter, Salisbury Heights, both of Australia, assignors to Senil Nominees Pty. Ltd. and Australian Merino Wool Harvesting Ltd., both of, Australia

Original No. 4,237,896, dated Dec. 9, 1980, Ser. No. 62,640, Aug. 1, 1979. Continuation of Ser. No. 920,239, Jun. 29, 1978, abandoned, which is a continuation-in-part of Ser. No. 900,139, Apr. 26, 1978, abandoned, which is a continuation of Ser. No. 708,934, Jul. 27, 1976, abandoned. Application for reissue Dec. 8, 1982, Ser. No. 447,981

Int. Cl.³ A61N *1/32*

U.S. Cl. 128—419 R **9 Claims**



1. A method of producing temporary immobilization of an animal undergoing animal husbandry without rendering the animal unconscious, including the step of [implanting] *placing* electrodes [subcutaneously and clipping them to the hindquarters and forwardly thereof along the spine of the animal, the electrodes piercing the skin and the fatty tissue beneath thereby to contact] *in electrical conductive relationship with* the ionized fluid beneath the skin *at spaced apart locations along the spine of the animal* allowing a low voltage to be used, *one of said spaced points being in the hindquarters of the animal and the other being in the head, neck or forequarters thereof,* subjecting the electrodes to a current flow driven by a potential of up to about 55 volts maximum to produce immobilizing simultaneous [muscular] tetanic contraction [in] *of the major skeletal muscles of* the animal and, while the animal is thus immobilized, performing animal husbandry on the animal.

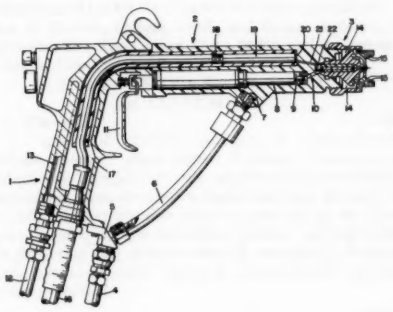
Re. 31,867
ELECTROSTATIC SPRAY GUN

James L. Kennon, Avon, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Original No. 4,182,490, dated Jan. 8, 1980, Ser. No. 877,445, Feb. 13, 1978. Application for reissue Mar. 12, 1982, Ser. No. 357,403

Int. Cl.³ B05B *5/02*

U.S. Cl. 239—3 **25 Claims**



27. An electrostatic coating apparatus comprising:

a nozzle portion made from substantially nonconductive material, having a fluid discharge opening and effective to project a dispersed cloud of coating material therefrom;

a small electrode extending through said fluid discharge opening and forwardly from said nozzle portion;

a coating material conduit in communication with said fluid discharge opening;

a high voltage electrical path passing through the nozzle portion and adapted to connect said electrode to a source of high voltage electrical power; and

at least a first series resistor in said electrical path located in said nozzle portion directly behind said electrode and being connected thereto, said first series resistor being in at least the megohm range.

29. A method of electrostatic spray coating comprising the steps of:

dispensing a disperse cloud of coating material toward an object to be coated from a substantially electrically nonconductive nozzle;

imparting an electrical charge to said coating material by means of a small electrode extending from the nozzle, said electrode being disposed in the flow path of said coating material as it leaves the nozzle;

supplying high voltage electrical power to said electrode from an electrical power source sufficient to impart said charge on said coating material, through at least a first resistor in at least the megohm range having one end connected to the electrode and being located in said nozzle and in the flow path of said coating material directly behind said electrode.

Re. 31,868

LOW ATTENUATION OPTICAL FIBER OF DEUTERATED POLYMER

John K. Beasley, Greenville; Richard Beckerbauer, Wilmington, both of Del.; Henry M. Schleinitz, Kennett Square, Pa., and Frank C. Wilson, Wilmington, Del., assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Original No. 4,138,194, dated Feb. 6, 1979, Ser. No. 842,301, Oct. 14, 1977. Application for reissue Mar. 28, 1983, Ser. No. 479,472

Int. Cl.[3] **G02B** *5/172*

U.S. Cl. 350—96.30 **13 Claims**

1. An optical fiber comprising a core and cladding which consist essentially of organic high polymers, said core being a [deuterated acrylate] polymer *selected from the group consisting of a deuterated methacrylate homopolymer, a deuterated methacrylate copolymer and a deuterated methacrylate/acrylate copolymer* and containing less than 20 mg of hydrogen per gram of polymer as measured by nuclear magnetic resonance of 60 MHz.

PLANT PATENTS

GRANTED APRIL 16, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,436
COTTONTAIL—MINIATURE ROSE PLANT

Leslie E. Strawn, Garden Grove, Calif., assignor to Cecelia Lucy Daphne Bennett, Chula Vista, Calif.

Filed Sep. 1, 1983, Ser. No. 528,652
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of miniature rose plant named "Cottontail" of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by its abundance of white blooms and having an extremely vigorous growth habit, easy to propagate from cuttings, with flowers usually borne in sprays of 6 to 12 or more.

5,437
MINIATURE ROSE PLANT

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Aug. 22, 1983, Ser. No. 525,497
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant named 'My Delight' of hardy, dwarf, vigorous growth, attractive in appearance, substantially as illustrated and described, characterized by its blooms of pale pink with slightly deeper pink inner petals and exhibition form, easy to propagate from cuttings, with flowers borne usually one to a stem, but occasionally in sprays of 3 to 5 or more.

5,438
NECTARINE TREE - EARLY DIAMOND

Norman G. Bradford, 11875 E. Savana Rd., LeGrand, Calif. 95333

Filed Aug. 1, 1983, Ser. No. 518,964
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A very early fresh market nectarine distinguishable by its full red color, excellent firmness, excellent shelf life and shipping quality, and good eating, which ripens six to seven days before the parent plant Aurelio Grand (U.S. Plant Pat. No. 3,755) and among earliest commercial varieties.

5,439
CARNATION NAMED LONDONIE

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, Antibes, France

Filed Jul. 25, 1983, Ser. No. 516,513
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—73 **1 Claim**

1. A new and distinct spray carnation, substantially as herein shown and described, characterized by the bright red color of its small blooms borne on thin, erect stems, a vigorous growth habit with abundant foliage, and a habit of blooming profusely during its Spring and Fall flowering seasons.

5,440
CHRYSANTHEMUM PLANT NAMED BALLERINA

William E. Duffett, Salinas, Calif., and Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, assignors to Grace H. Mack, New Canaan, Conn.

Filed Jul. 15, 1983, Ser. No. 514,320
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant named Ballerina, as illustrated and described, and identified by the combined characteristics of spider capitulum form, with tubular shaped ray florets, decorative capitulum type, white ray floret color, diameter across face of capitulum up to 85 mm., medium plant height, upright branching pattern, average natural season flowering date of Sept. 15, and average flowering response period of seven weeks in photoperiodic controlled short day programs.

5,441
CHRYSANTHEMUM PLANT NAMED CAMELOT

William E. Duffett, Salinas, Calif., and Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, assignors to Grace H. Mack, New Canaan, Conn.

Filed Jul. 15, 1983, Ser. No. 514,318
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—80 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant named Camelot, illustrated and described, and identified by the combined characteristics of flat capitulum form, decorative capitulum type, lavender ray floret color, diameter across face of capitulum up to 55 mm., tall plant height, upright branching pattern, average natural season flowering date of September 28, and average flowering response period of seven weeks in photoperiodic controlled short day programs.

PLANT PATENTS

GRANTED APRIL 11, 1989

PATENTS

GRANTED APR. 16, 1985

ERRATA

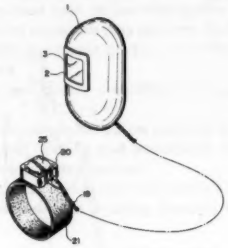
For CLASS	See PATENT NO.
083–176	4,510,841
175–007	4,510,985
384–536	4,511,191
384–543	4,511,192
384–611	4,511,193
333–189	4,511,202
358–261	4,511,213
432–106	4,511,333
534–631	4,511,506
534–629	4,511,507
426–665	4,511,508
514–743	4,511,556
514–263	4,511,557
514–008	4,511,558
514–054	4,511,559
514–027	4,511,560
424–195	4,511,561
514–112	4,511,562
514–162	4,511,563
514–167	4,511,564
514–173	4,511,565
514–242	4,511,566
514–253	4,511,567
514–293	4,511,568
514–290	4,511,569
514–282	4,511,570
514–351	4,511,571
514–340	4,511,572
514–332	4,511,573
514–371	4,511,574
514–423	4,511,575
514–423	4,511,576
514–448	4,511,577
514–469	4,511,578
514–490	4,511,579
514–578	4,511,580
514–617	4,511,581
514–654	4,511,582
548–215	4,511,714
514–601	4,511,735

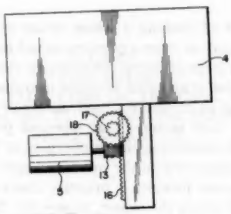
PATENTS

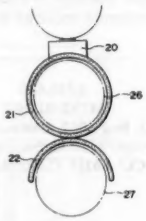
GRANTED APRIL 16, 1985

GENERAL AND MECHANICAL

4,510,625
LIGHT-SHIELDING PROTECTIVE MASK
Nobuo Mizuki, 886-55 Hiratocho, Totsuka-ku, Yokohama City, Kanagawa Prefecture, Japan
Filed Oct. 22, 1981, Ser. No. 313,645
Int. Cl.³ A61F 9/06
U.S. Cl. 2—8 **5 Claims**

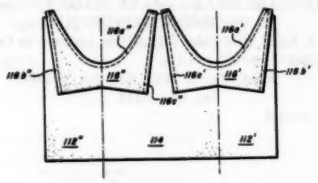






1. A welder's mask comprising:
(a) a mask body having a viewing window;
(b) a light-shielding plate having a low light transmitting coefficient and having dimensions greater than said window, slidably mounted on said mask body for movement between a first position where said plate covers said window and a second position where said plate uncovers said window;
(c) a motor mounted on said mask body;
(d) a conversion means mounted on said mask body and connected to said plate and to said motor for moving said plate between said first and second positions;
(e) a switch holder having an arcuate portion adapted to fit a finger of the welder;
(f) electric push button switch means having a movable button, said switch being mounted on said holder in position with said button immediately adjacent the side of an adjacent finger of said welder to move to a first position when pressure above a predetermined level is exerted upon said button by said adjacent finger and into a second position when said pressure is reduced below said predetermined level;
(g) said mask having first electrical switching means operative to rotate said motor in a first direction to activate said conversion means and move said plate into a first position and to stop said motor when said plate moves into said first position when said button is in said first position;
(h) said mask having second electronic switching means operated to rotate said motor in a second opposite direction to activate said conversion means and move said plate in opposite direction into a second position and to stop said motor when said plate moves into said second position when said button is in said second position; and
(i) electric lead wire means for connecting said switch to said first and second means for rotating said motor.

4,510,626
FLAT PLANE SEAM GARMENT AND METHOD OF MAKING
Philip N. Bowditch, Cohasset, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.
Filed Jun. 1, 1983, Ser. No. 500,080
Int. Cl.³ A41B 1/00
U.S. Cl. 2—115 **2 Claims**

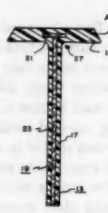


1. A garment comprising:
body portions including front and back portions with a shoulder hole between those front and back portions,
a generally tubular sleeve and shoulder portion having a sleeve and shoulder seam extending along its length, one end of said sleeve and shoulder portion being joined to the perimeter of said shoulder hole along a sleeve-to-shoulder seam,
wherein the regions of said body portions adjacent to said sleeve-to-shoulder seam are substantially parallel to the regions of said shoulder and sleeve portion adjacent to said sleeve-to-shoulder seam, when said regions of said body portions adjacent to said sleeve-to-shoulder seam are positioned in a plane without the sleeve and shoulder seam being joined, and wherein the regions of said body portions adjacent to said sleeve-to-shoulder seam are non-parallel with respect to the regions of said shoulder and sleeve portion adjacent to said sleeve-to-shoulder seam when said regions of said body portions adjacent to said sleeve-to-shoulder seam are positioned in a plane with said sleeve and shoulder seam being joined.

4,510,627
OSSICULAR PROSTHESIS

Harry T. Treace, Hohenwald, and Calvin Griggs, Memphis, both of Tenn., assignors to Treace Medical, Inc., Memphis, Tenn.

Filed Oct. 25, 1982, Ser. No. 436,501
Int. Cl.³ A61F 1/00
U.S. Cl. 3—1 10 Claims



1. An ossicular replacement implant comprising:

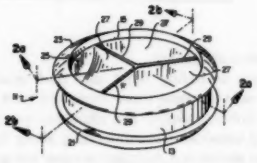
(a) a body including an elongated shaft having a first end forming an enlarged and substantially flat head portion, said head portion and said shaft being molded out of a biocompatible porous material as an integral one piece unit; and

(b) a core encased within said body, said core having substantially higher sound transmitting qualities than said body, said core including an elongated core shaft aligned substantially concentric within said shaft of said body and further including a first end forming an enlarged and substantially flat head positioned within and substantially concentric within said head portion of said body; and wherein said body and said core being permanently bendable to allow said implant to be permanently bent to a specific shape by a surgeon during the implantation thereof to conform to the patient's middle ear structure, said core being stationary with respect to the body.

4,510,628
ARTIFICIAL HEART VALVE MADE BY VACUUM FORMING TECHNIQUE

Willem J. Kolff, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed May 3, 1982, Ser. No. 374,051
Int. Cl.³ A61F 1/00
U.S. Cl. 3—1.5 13 Claims

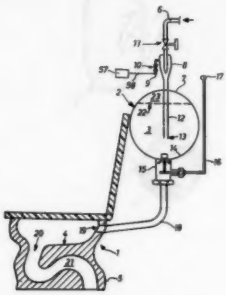


1. An aritifical heart valve comprising means for forming an annular frame which defines an inflow end and an outflow end of said heart valve, and a plurality of thin leaflet members supported by said frame such that adjacent edges of each said leaflet member project radially inward toward the center of said frame to form a narrow slit between each leaflet pair through which blood flows from said inflow end to said outflow end, each leaflet member comprising a first discrete sheet of elastomeric material and a second discrete sheet of elastomeric material formed over said first sheet such that the only seam between said first and second sheets which occurs in the path of the blood as it flows from said inflow end to said outflow end occurs at said slits formed between each leaflet pair.

4,510,629
METHOD OF FLUSHING A WATER CLOSET

Herbert Jovy, Irschenhausen, and Wilhelm Schuster, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Ermital AG, Liechtenstein

Continuation-in-part of Ser. No. 298,345, Aug. 31, 1981, abandoned. This application Jun. 24, 1982, Ser. No. 391,499
Claims priority, application European Pat. Off., Mar. 30, 1982, 82102657.2
Int. Cl.³ E03D 1/24
U.S. Cl. 4—332 4 Claims

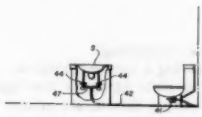


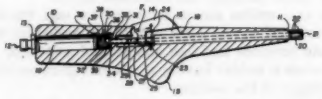
1. A method of flushing a water closet by simultaneously feeding water and air from a pressure vessel into a toilet bowl, comprising the steps of filling the pressure vessel by discharging a jet of water at elevated pressure into the pressure vessel and causing the jet of water to aspirate air to deliver a larger amount of air than water air at elevated pressure into the pressure vessel; continuing the discharging of the jet of water to obtain a pressure within the pressure vessel of the order of three atmospheres; forming a pressure cushion of air in the pressure vessel above the water, where the feeding of water only at a water pressure higher than about three atmospheres into the pressure cushion space of the pressure vessel and initiating a flushing valve to thereby release the combined pressurized air/water medium to affect a highly accelerated water/air column whereby more air is employed in the flushing action.

4,510,630
MINI-BIDET

R. W. Osgood, P.O. Box 1062, Cameron Park, Calif. 95682

Filed Apr. 1, 1983, Ser. No. 481,356
Int. Cl.³ A61H 35/00; A47K 3/22
U.S. Cl. 4—443 19 Claims





1. In a bathroom facility including a toilet having a seat and

further having a sidewall beneath the seat, the facility further including a sink having a conventional source of pressurized water, a bidet apparatus comprising in combination:

a hand-held housing, holder means attached to the sidewall of the toilet for storing the housing, whereby the bidet apparatus is convenient to the user, yet outside the toilet bowl and relatively free from contamination, the housing having contained therein,

a spray tube,

the spray tube being slidably removable from the housing and readily replaced with an interchangeable spray tube, whereby the bidet apparatus may perform the functions of a douche implement, enema device or the like,

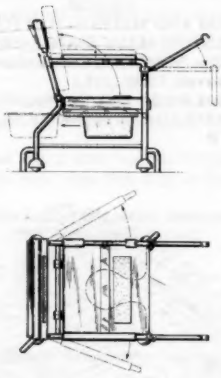
valving means and

actuation means operatively associated with said valving means,

a flexible conduit means connected on one end to, and interposed between, said housing and attachment means on an opposed end of said conduit means,

whereby said attachment means taps the source of pressurized water supplying same to said housing through said conduit means.

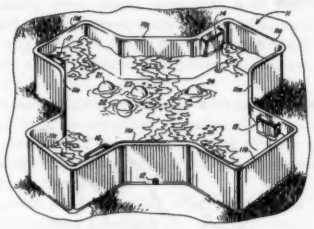
4,510,631
COMMODE
Marilyn Grady, 7541 S. Crane Dr., Oak Creek, Wis. 53154
Filed Nov. 17, 1983, Ser. No. 552,697
Int. Cl.³ A47K *11/04*
U.S. Cl. 4—478 **6 Claims**



1. A bedside commode having a seat, a wheel mounted support structure for the seat and a pair of side armrests and a backrest on the support structure, said commode comprising,

a connector arm extending outwardly from the front of said commode with one end of said arm having means for pivotally connecting said arm to said commode and the other end of said arm having means for releasably securing said commode to a bed and maintaining said commode a predetermined distance from said bed so that said commode is maintained in a position with the forward edge of said seat parallel to and a predetermined distance from the side of said bed so that the user of said commode may position his legs in the space between said bed and said commode.

4,510,632
CHILDREN'S GAME POOL
Christopher C. Elsis, 3720 19th Ave. SW., Naples, Fla. 33999
Filed Oct. 12, 1982, Ser. No. 433,716
Int. Cl.³ E04H *3/18*
U.S. Cl. 4—488 **4 Claims**



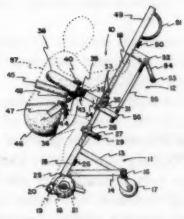
1. A children's game pool comprising:

a flat bottomed pool constructed essentially entirely of plastic material, said pool having vertical side walls and being shaped in plan view like a modified Greek cross so as to form four similar three-sided compartments within the interior of said pool,

said four compartments each having permanently affixed to the interior of one side wall of the compartment an open topped storage bin, and

a toy water pistol storable within said bin and permanently attached to said pool by a flexible hose.

4,510,633
INVALID TRANSFER MEANS
Mark W. Thorne, 3216-6 Stonesthrow La., Durham, N.C. 27713
Filed Dec. 20, 1982, Ser. No. 432,332
Int. Cl.³ A61G *7/08*
U.S. Cl. 5—81 R **13 Claims**

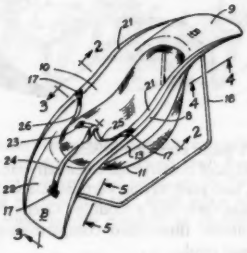


1. A transfer means for invalid type persons comprising: a carriage means; lever means connected to and extending above said carriage means and movable between an initial inclined transport position in which said lever means extends over the center of gravity of said carriage means and a generally vertical loading position; means adjustably mounted on said lever means for supporting said person from both the posterior and anterior of the person's body; and means for tilting said lever means and its supported person between said loading position and said transport position in which said person is disposed generally above the center of gravity of said carriage means whereby a relatively simple and yet highly efficient device for moving invalid type persons is provided.

4,510,634
INFANT CARRIER

Brian J. Diedrich, 10570 E. Oakwood Dr., Tucson, Ariz. 85715, and Leslie G. Wolf, II, 1967 W. Riverview, Tucson, Ariz. 85745

Filed Sep. 30, 1983, Ser. No. 537,502
Int. Cl.[3] A47C 29/00; A47D 7/00
U.S. Cl. 5—98 B 6 Claims



1. An infant carrier, comprising:

a frame assembly comprised of an upper frame member and a lower frame member, said assembly being suitably constructed for the attachment of an infant supporting means, a body harness and a support stand; and

means attached between said upper frame member and said lower frame member for supporting an infant in a supine position; and

said upper frame member is suitably contoured at opposed topmost and bottommost portions to facilitate said infant carrier being transported by the utilization of an adult's wrists and forearms, wherein said upper frame member includes:

an inner side wall extending continously along the inner periphery; and

a pair of marginal flanges formed along opposed outer lateral sides; and

opposed lateral top surfaces suitably molded so as to blend with said inner side wall, said marginal flanges and said topmost and bottommost portions; and

a complement of slots adapted for attaching a body harness and suitably located on opposed sides of said top lateral surfaces and on said bottommost portion; and

a plurality of male locking pins suitably located and spaced on the undermost part beneath said top lateral surfaces and beneath said topmost and bottommost portions, whereby said male locking pins will provide a means for attaching to said lower frame member and securing an infant supporting means therebetween; and

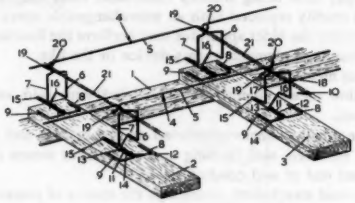
a pair of rearwardly projecting sockets horizontally and laterally spaced on the backside of the topmost portion and suitably on said backside so as to provide a means of attachment of the ends of a tubular support stand; and

a pair of rearway projections clips horizontally and laterally spaced on the backside of the bottommost portion and suitably located on said backside so as to provide a means of attaching a crossbar portion of a tubular support stand, said clips and said sockets are suitably located so as not to cause a tubular support stand to interfere with transporting said infant carrier by means of said contoured topmost and bottommost portions.

4,510,635
BOX SPRING ASSEMBLIES

Arnold Woffendin, Colne, England, assignor to Silentnight Holdings PLC, Lancashire, United Kingdom

Filed Jun. 14, 1983, Ser. No. 504,371
Claims priority, application United Kingdom, Jun. 18, 1982, 8217733; Apr. 9, 1983, 8309711
Int. Cl.[3] A47C 23/02, 23/00; F16F 3/00
U.S. Cl. 5—247 9 Claims

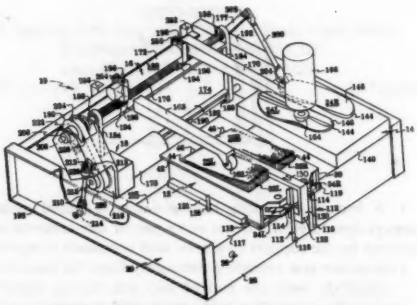


1. A box spring assembly including a foundation and defining a deck for receiving a bedding load, comprising a plurality of deck elements each formed from a single length of wire having an elongate central section terminating in curved sections extending at least in some elements into spring legs, the deck elements being arranged in parallel lengthwise rows with adjacent elements of each row having aligned central sections and adjacent curved sections being secured to each other and to adjacent rows by transverse helical connecting elements, whereby the central sections of the spring elements and the transverse helical connecting elements together form the deck, the deck being supported by the spring legs which are secured at their lower ends to the foundation.

4,510,636
SYSTEM AND METHOD FOR FORMING CUSTOM-MADE SHOE INSERTS

Edward H. Phillips, Middletown, Calif., assignor to Amfit Incorporated, Sunnyvale, Calif.

Filed Jul. 23, 1981, Ser. No. 286,244
Int. Cl.[3] A43B 7/14, 13/38; A43D 1/02; C14B 1/44
U.S. Cl. 12—1 R 28 Claims



1. A system for forming a custom-made shoe insert for a person's foot, said system comprising:

impression means for forming and releasably retainng an impression of the contour of the undersurface of the person's foot;

holding means for holding a blank;

sensing and shaping means for sensing the impression and removing material from the blank in conformance with the sensed impression; and

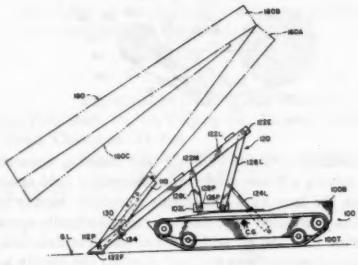
drive means for automatically driving the sensing and shaping means both laterally and to-and-fro across the impression and the blank to automatically form the custom-made shoe insert from the blank in conformance with the impression.

4,510,637

BRIDGE LAUNCHER

Lucjan Zlotnicki, R.D. 3, Box 3591, Spring Grove, Pa. 17362

Filed Mar. 14, 1983, Ser. No. 475,371
Int. Cl.³ E01D *15/12*
U.S. Cl. 14—2.4 **31 Claims**



31. A bridge transporting, launching and retrieving vehicle comprising:

(a) a vehicle body and chassis;

(b) support means rotatable about a vertical axis mounted to said vehicle; and

(c) a bridge launching and retrieving mechanism attached to the support means and operative to launch bridges in different directions relative to the vehicle body; and

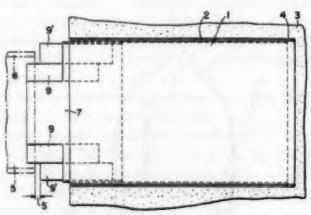
wherein said vehicle body has an opening and said rotatable support means comprises a basket mounted and rotatable in said opening.

4,510,638

TRANSFER BRIDGE FOR RAMPS

Kurt Alten, Ringstr. 14, D-3015 Wennigsen, Fed. Rep. of Germany

Filed Jun. 2, 1982, Ser. No. 384,349
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3121994
The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.
Int. Cl.³ E01D *1/00*
U.S. Cl. 14—71.7 **3 Claims**



1. A transfer bridge for use between a ramp and a platform, said bridge comprising:

a bridge plate having a first end and a second end, said first end being pivotably connected to said ramp in such a way as to be pivotable about a horizontal axis;

a retractable and extendable extension provided in said second end of said bridge plate for placement on said platform;

tongues supported by and extending from said extension, and capable of being respectively pushed in, i.e., of being pushed toward said first end of said bridge plate; means to hold said tongues, in the pushed-in state, structurally arrested in position;

double-acting drive means associated with said extension and said tongues respectively for extending same, and for retracting same subsequent to a pushing-in of said tongues, to form a gap between said pushed-in tongues and said platform;

first operating elements associated with said drive means for respective actuation of the extension and retraction functions thereof, and a second operating element associated with said bridge plate for actuation of a lowering pivotal movement thereof; and

a time switch associated with either of said first operating elements serving to actuate the extension function of said drive means or said second operating element bringing about the lowering pivotal movement of said bridge plate, upon the release of one of said operating elements, said time switch effecting a partial retraction of said extension and said tongues.

4,510,639

VEHICLE WASHING APPARATUS HAVING FLEXIBLE BRUSHES

James W. Roncaglione, 9807 Bridleridge Ct., Vienna, Va. 22180

Filed May 10, 1983, Ser. No. 493,345
Int. Cl.³ G60S *3/06*
U.S. Cl. 15—53 AB **9 Claims**

1. A vehicle washing apparatus, comprising:

overhead support means located above the path of a vehicle to be washed;

a plurality of elongate vertically disposed flexible and rotatable washing members connected with said overhead support means arranged to wash at least one end and the top or sides of a vehicle passing through said apparatus, each of said washing members comprising flexible elongate substantially non-resilient axial support means consisting essentially of a braided cable for supporting washing material thereon and washing material arranged on said axial support means, said elongate flexible washing members having a free lower end whereby when a vehicle contacts said washing members, said washing members are free to flex and move from the path of the vehicle and to conform to the surface contours of the vehicle being washed; and

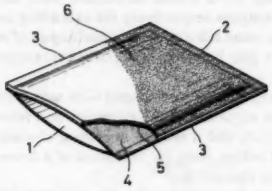
rotating means for individually rotating each of said washing members to enhance the scrubbing action thereof.

4,510,640

DUSTER-POLISHER MADE OF PLASTIC FILM

Shogo Omori, 17-23, Mino 8-chome, Mino City, Osaka 562, Japan

Filed Jan. 6, 1984, Ser. No. 568,617
Int. Cl.³ A47L *13/18, 13/38*
U.S. Cl. 15—104 A **4 Claims**



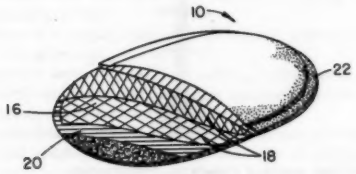
1. A duster-polisher made of plastic film which comprises a duster part and a polisher part of the same size separably overlapped one upon the other with an alienating adhesive layer interposed therebetween; said duster part being substantially two sheets of plastic film overlapped and connected at each opposing side such that a pocket without bottom is formed, one face of said pocket being coated with a pressure sensitive adhesive to define an adhesive layer; said polishing part consisting of, at least, one sheet of plastic film, one face thereof being attached to the adhesive layer of the duster part as a protector film with said alienating adhesive layer interposed therebetween, the other face being soft and rough to define a polishing face.

4,510,641

SCRUBBING PAD

Kenneth L. Morris, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 9, 1983, Ser. No. 549,851
Int. Cl.³ A47L *13/17*
U.S. Cl. 15—118 **11 Claims**



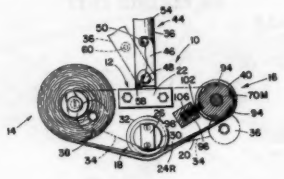
1. A scouring pad comprising:
an elongated flattened body having two major surfaces of appropriately the same size, the first of said surfaces being composed of randomly oriented metallic fibers forming a non-woven cloth layer and the second major surface being composed of a reticulated plastics foam material;
means adhesively securing the edges of said first and second major surfaces together only around a major portion of their mating peripheries so as to form a pocket therebetween, said pocket being accessible through a portion of said periphery which is not adhesively secured;
two layers of netting of plastics material sandwiched between said major surfaces and lining said pocket to form a permeable holder for a cleaning substance therebetween, the edges of the netting being also adhesively secured together around a major portion of their peripheries.

4,510,642

COMBINATION BOWLING LANE STRIPPER AND DUSTER

Donald E. Ingermann, Arvada; Ronald L. Smith, Boulder; Jimmie L. Knoll; Stephen F. Caffrey, both of Arvada; Endre Barsi, Northglenn, and Joseph C. Dechant, Aurora, all of Colo., assignors to Century International Corp., Golden, Colo.

Filed Dec. 19, 1983, Ser. No. 563,074
Int. Cl.³ A47L *13/20*
U.S. Cl. 15—231 **8 Claims**



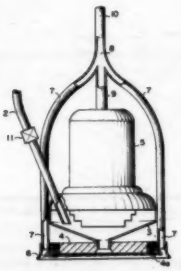
1. In a manually-operated bowling lane cleaning apparatus of the type having a frame made up of sideplates held spaced apart to span the lane by a crossframe structure, supply and take-up rollers journalled for rotation in longitudinally-spaced parallel relation fore and aft within the crossframe structure, a pressure roller disposed between and beneath the supply and take-up rollers paralleling the latter, a handle attached to the frame for pushing same along the lane, a web of fabric reaved from the supply roller underneath the pressure roller and onto the take-up roller, the pressure roller cooperating with one of the other rollers to maintain the section of fabric stretched therebetween in area contact with the lane surface, and front and rear pairs of wheels disposed at the outside corners of the frame, at least one pair of wheels being positioned to enter the ball gutters alongside the lane for keeping the pressure roller centered therebetween when the roll of fabric on one of the supply and take-up rollers is a size to lift the other pair free of the ball gutters, the improvement which comprises: tapering the pressure roller from the middle toward both ends and providing same with a compressible cushioned surface.

4,510,643

VACUUM FLOOR POLISHER

Hisao Kitada, 3115 Oaza Kitano, Tokorozawa-shi, Saitama-ken, Japan

Filed May 2, 1983, Ser. No. 490,847
Claims priority, application Japan, Jun. 1, 1982, 57-93584
Int. Cl.³ A47L *11/03*
U.S. Cl. 15—320 **5 Claims**



1. A vacuum floor polisher comprising:
(a) a rotary polishing disc which rotates polishing material and polishes the floor, the bottom of said rotary polishing

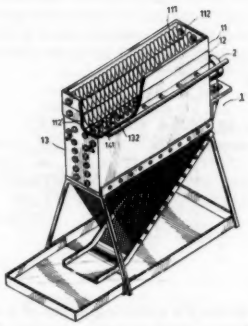
disc being provided with grooves for guiding the polishing material outwardly;
(b) a tank for the polishing material;
(c) a first conduit which guides the polishing material fed from the tank into the center of the rotary polishing disc;
(d) a skirt provided at the periphery of the rotary polishing disc forming an enclosure about said disc, said skirt preventing the polishing material from being spread outwardly beyond the periphery of said disc by the rotation of said disc; and
(e) a second conduit extending from said enclosure to said tank; and means cooperating with said second conduit to create a suction flow into said second conduit in said enclosure thereby introducing atmospheric air under the inner edge of the skirt and causing the polishing material to be recovered in the tank.

4,510,644

FISHING SCALING APPARATUS

Chen-Piau Sheh, No. 56, Taiping Rd., Yuanbei Subward, Homei Town, Changhua, Taiwan

Filed Aug. 20, 1982, Ser. No. 410,023
Int. Cl.³ A22C *25/02*
U.S. Cl. 17—64 **2 Claims**



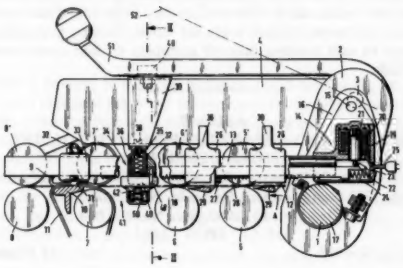
1. A fish scaling apparatus comprising:
(A) a housing;
(B) flexible guide entry means,
(i) means mounting said flexible guide entry means in the housing,
(ii) said flexible guide entry means receiving and feeding downstream fish introduced into the fish scaling apparatus;
(C) a pair of flexible elongated scaler members of transverse circular cross-section,
(i) means mounting said scaler members for rotation in the housing downstream of the flexible guide entry,
(ii) said mounting means for said scaler members supporting said scaler members in parallel spaced apart relationship,
(iii) means to rotate said scaler members in opposite directions so as to jointly provide
(a) a linear transportation force to transport downstream fish fed between them by the flexible guide entry means and
(b) remove scales from said fish; and
(D) conveying means,
(i) means mounting said conveying means in the housing downstream of the flexible scaler members in a position to receive scaled fish from said flexible scaler members and to transport scaled fish away therefrom;
(E) the linear transporting speed of said conveying means being less than the linear transporting speed of said flexible scaler members so as to generate a hindering force to fish while they still are being transported and being scaled by said pair of flexible scaler members;
(F) said conveying means comprising two flat belts having reaches in parallel and spaced from one another,
(i) means to drive said reaches at the same speed and in the same downstream direction,
(ii) so as to provide a passage for receiving scaled fish from the pair of flexible scaler members;
(G) said flexible guide entry means comprising at least two elongated parallel first coil spring members mutually spaced apart to provide a passage for engagingly passing fish therethrough and delivering them to the scaler members;
(H) each said pair of flexible scaler members comprising a second elongated coil spring member,
(i) means to mount the ends of each coil spring member for rotation in the housing,
(ii) a plurality of scalers carried by, and radially projecting from, convolutions of the second coil spring members,
(iii) individual ones of the scalers being spaced apart from adjacent scalers angularly along the spiral length of each of the second coil spring members.

4,510,645

CONSTRUCTION OF DRAW FRAMES FOR SPINNING MACHINES

Alfred Glock, Stuttgart, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 11, 1983, Ser. No. 512,909
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1982, 3226151
Int. Cl.³ D01H *13/16*
U.S. Cl. 19—0.25 **7 Claims**



1. A drawing frame for a thread spinning machine comprising at least a set of inlet rollers for receiving a roving from a source, a set of exit rollers spaced from the inlet rollers and between which said roving is drawn, each of said inlet and exit roller sets comprising a lower driven roller and a pair of axial spaced upper rollers permitting the drawing of two rovings side by side, said upper rollers being journalled in ranked pairs on a common supporting arm journalled at its upstream and extending operatively in a horizontal direction to cause said upper roller to engage with said lower rollers and being liftable therefrom to remove said upper rollers from engagement with the lower rollers, a bearing rail extending along each side of said supporting arms, said bearing rails being journalled at their downstream ends to be freely movable to a position parallel to the operative horizontal position of said supporting arm and to a position lifted upwards therefrom, and blocking means mounted on each rail for holding said roving to said upper roller responsive to the sensing of a breakage of the thread, and means for causing said supporting arm to freely weigh on said bearing rails, and means disengageably maintaining said supporting arm and bearing rails parallel in operative position,

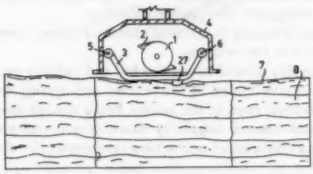
while permitting disengagement and independent lifting movement of said supporting arm and said bearing rails.

4,510,646

DEVICE FOR CONTROL OF CONDUCTIVE MATERIALS IN BALE-BREAKER MACHINES

Claudio Locatelli, Capriolo, and Claudio Dragagna, Pavia, both of Italy, assignors to F. LLI Marzoli & C. S.P.A., Palazzio Sull'Oglio, Italy

Filed Jun. 6, 1983, Ser. No. 501,570
Claims priority, application Italy, Jun. 8, 1982, 21750 A/82
Int. Cl.³ D01G *7/06*
U.S. Cl. 19—80 R **11 Claims**



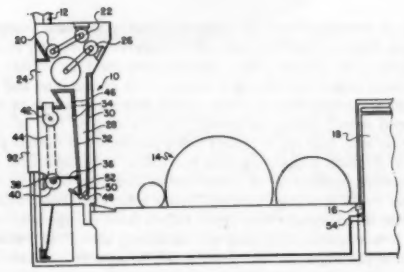
1. An improvement in a device for detecting the presence of conductive materials in bales of textile fibers for bale-breaker machines having rotating take-off members and elongate bale-pressure elements arranged parallel to each other between said take-off members and substantially perpendicularly to a rotation axis of said take-off members, wherein the improvement comprises conductance sensors associated with said bale-pressure elements and sensitive to the conductance existing between any two adjacent of said bale-pressure elements, each control means responsive to the conductance sensed by each of said sensors to cause the bale-breaker machine to be operative when the conductance between any two adjacent of said bale-pressure elements exceeds a pre-set value, thereby preventing damage to said rotating take-off members by said conductive materials.

4,510,647

METHOD AND APPARATUS FOR CONTROLLING FIBER DENSITY

Alex J. Keller, 75 Ridgeport Rd., Clover, S.C. 29710, and Akiva Pinto, 525 Eastwood Dr., Gastonia, N.C. 28052

Filed Oct. 13, 1982, Ser. No. 434,009
Int. Cl.³ D01G *15/40*
U.S. Cl. 19—105 **11 Claims**



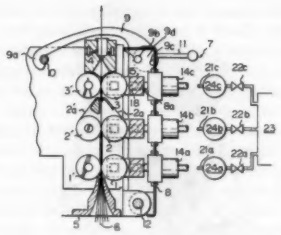
1. Apparatus for processing textile materials, including:
(a) fiber feeding means for receiving fiber and forming said fiber into a batt, said fiber feeding means including chute means for collecting said fiber, selectively variable pneumatic means for exerting a pneumatic compressing force on said collected fiber in said chute means, and selectively variable mechanical means for mechanically compressing said collected fiber in said chute means;
(b) carding means receiving said batt of fiber from said fiber feeding means and forming said fiber into a sliver; and
(c) regulating means including:
(i) first signaling means for sensing the density of said sliver and for generating high and low signals indicating, respectively, that said sliver density is above or below a predetermined level; and
(ii) control means for receiving said generated signals and for varying the operation of said pneumatic means and said mechanical means to decrease the compression of said collected fiber in said chute means upon receipt of said high signal and to increase the compression of said collected fiber upon receipt of said low signal.

4,510,648

WEIGHTING DEVICE FOR DRAFTING MEANS

Mitsuo Mori, Toyota; Yoshihisa Suzuki, Chiryu; Shigeru Muramatsu, Okazaki, and Sigeru Takasu, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jul. 14, 1983, Ser. No. 513,410
Claims priority, application Japan, Jul. 15, 1982, 57-122166
Int. Cl.³ D01H *5/52*
U.S. Cl. 19—266 **3 Claims**



1. A weighting device for a drafting means of a textile machine such as a spinning frame having a plurality of spinning units, said drafting means being a plurality of pairs of a bottom side roller and a top side roller, comprising a plurality of pressing units exerting weighting force onto said top side roller, each of which units is provided above each said pair of rollers, wherein said pressing unit comprises a loading means utilizing fluid pressure wherein said pressing units are classified into at least two groups according to positions of said pairs of rollers to which said pressing unit engages and wherein each group of said pressing units, at least in one textile machine, is provided with common piping for supplying fluid of uniform pressure to branches extending to said pressing units belonging to said group and wherein each of said branches has an automatic valve operatively connected to a yarn sensor of each of said spinning units whereby the pressure to the pressing units can be released in response breakage of the yarn.

4,510,649

TIE STRIP

Donald W. Yudis, 322 Grimes Bridge Rd., Roswell, Ga. 30075, and Roy A. Moody, 755 Ash St., Flossmoor, Ill. 60439

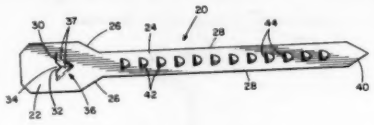
Filed Jun. 3, 1983, Ser. No. 500,660
Int. Cl.³ B65D *63/00*
U.S. Cl. 24—16 PB **16 Claims**

1. An integral tie strip formed from sheet stock, comprising:
a substantially planar elongated flexible strip;
a plurality of raised portions formed on and projecting from the plane of said strap, said raised portions being spaced along the length of said strap with each of said raised portions being formed from a portion of said planar strap

immediately adjacent a strap slit, said strap slit including first and second opposing edges which are spaced apart transverse to the plane of said strap to define a mouth in said strap;

a substantially planar head formed at one end of said strap, having a head slit extending through said head of a width to accommodate receipt of said strap such that a strap inserted therein retains its substantially planar configuration; and

locking means affixed to said head for preventing inadvertent disengagement of one of said raised portions from said head upon retrograde movement of said strap, at least one of said head and said raised portions being flexible to permit movement of said raised portions through said head slit whereby movement of said strap toward said head and through said head slit causes said raised portions to pass therethrough and retrograde movement of said strap causes said head to engage one of said raised portions preventing withdrawal of said strap from said head, with said locking means ensuring that said raised portion is not inadvertently removed from said head slit.

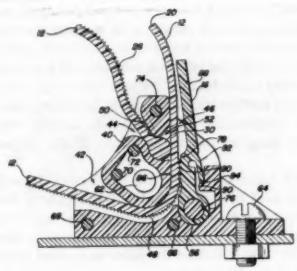


4,510,650

CABLE CLAMP ASSEMBLY

Cesar Espinoza, Buena Park, Calif., assignor to Hollingsead International, Inc., Santa Fe Springs, Calif.

Filed Dec. 28, 1983, Ser. No. 566,273
Int. Cl.³ B65D *63/00*; F16L *33/08*
U.S. Cl. 24—16 PB **13 Claims**



1. In a clamp assembly adapted for clamping wire bundles and attaching the same to a housing or the like, the combination comprising:

a flexible elongated strap member having a first, a second end, and serrations on a major portion of one side, the second end defining a securing means;

a substantially rigid strap receiving member having a pair of sidewalls, a bundle receiving surface disposed substantially at right angles to the sidewalls, first and second slot-like openings on either side of the bundle receiving surface, a third slot-like opening spaced from the first opening, a first passageway including a bearing surface and extending inside the sidewalls between the first and third openings for receiving the first end of the strap member and a second passageway extending from the second opening for receiving the second end of the strap when inserted in a direction generally perpendicular to the sidewalls, the second passageway being dimensioned to engage the securing means on the second end of the strap member and prevent the second end of the strap member from passing therethrough in response to a pulling force on the first end of the strap member, one of said sidewalls defining an opening aligned with the second passageway so that the second end of the strap member may be inserted into the second passageway in a direction generally perpendicular to the sidewalls and be held captive therein; and

a pawl member having serrations complementary to the serrations on the strap member and secured to the strap receiving member adjacent the first passageway and on the opposite side thereof from the bearing surface; and

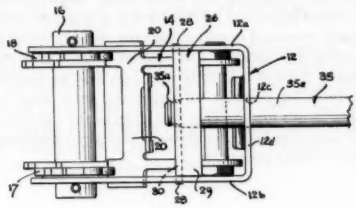
means for biasing the pawl member against the strap member whereby the serrations on the pawl member releasably engage the serrations on the strap member.

4,510,651

RATCHET BUCKLE WITH A REMOVABLE OPERATING LEVER

Ernest Prete, Jr., Woodland Hills, and Howard Knox, Simi, both of Calif., assignors to Ancra Corporation, El Segundo, Calif.

Filed Jan. 21, 1983, Ser. No. 460,078
Int. Cl.³ B25B *25/00*
U.S. Cl. 24—68 R **3 Claims**



1. In a ratchet buckle for tightening and tensioning straps having a reel and a pair of ratchet wheels fixedly connected therto, a bifurcated handle member having a pair of oppositely positioned parallel arms connected together by a cross arm, said parallel arms being rotatably mounted on the reel and a ratchet drive plate which engages the ratchet wheels such that when the handle member is actuated the wheel is rotatably driven, the improvement being means for manipulating the handle member comprising:

a cross member extending between the arms of the handle member and connected thereto, said cross member having an aperture formed therein, and

an elongated operating lever having one end portion thereof fitted into the aperture formed in the cross member, a main body portion greater in diameter than said aperture, a knob portion at said one end portion and a recessed portion between the knob portion and main body portion, the knob portion having a diameter approximately equal to that of said aperture and said recessed portion having a diameter less than that of said aperture, the recessed portion being opposite the edges of said aperture with the lever in its installed portion, the cross arm of the handle member having an aperture formed therein through which the main body portion of the lever is fitted.

4,510,652

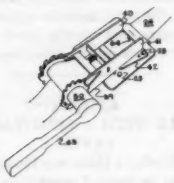
CARGO RESTRAINING DEVICE

Willem H. P. van Iperen, Westfield, N.J., assignor to Sea-Land Industries, Inc., Elizabeth, N.J.

Filed Feb. 7, 1983, Ser. No. 464,338
Int. Cl.³ B65D *67/00*
U.S. Cl. 24—68 CD **2 Claims**

1. A cargo restraining device having a tension plate for

secure mounting on a platform for a flexible strap, web or the like, said plate having side walls and end walls, spaced-apart strap-receiving openings in said plate, and an intermediate strap-supporting web extending from said side walls between said openings, said side walls having plate-retaining means in said side walls to retain said tension plate on a platform, said plate having at least one upturned strap-receiving lip edge and said plate end walls each having an upturned strap-receiving lip edge; said walls having spaced-apart plate-retaining openings therethrough for receiving fastening means therethrough and retaining said tension plate on a platform, and a removable



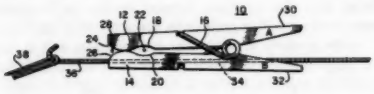
fixture having a strap-tightening ratchet means releasably mounted on said plate, said fixture having laterally spaced guide rails straddling said spaced-apart strap-receiving openings in said plate, said ratchet having a strap retaining cylinder rotatably mounted in said guide rails, means on said guide rails for releasably locking said ratchet means whereby a strap threaded through said strap openings may be fastened to said strap-retaining cylinder for tightening upon actuation of said ratchet means for securing said strap in the tightened position while inserting fasteners through said strap positioned in said strap-receiving openings.

4,510,653

METHOD AND APPARATUS FOR TYING BALLOONS AND THE LIKE

Mark Semanko, 47 West Levering Mill Rd., Bala Cynwyd, Pa. 19004

Filed Sep. 30, 1982, Ser. No. 431,265
Int. Cl.³ A44B *21/00*; A63H *3/06*
U.S. Cl. 24—131 C **5 Claims**



1. An apparatus for tying a knot in a neck of a balloon, the knot being wrapped around a string, comprising:

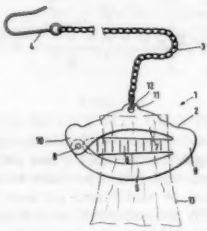
a clothspin having two members resiliently pivotally attached to one another intermediate to the ends of said members, the jaws when closed forming a channel aligned perpendicular to an axis defined by the members for receiving the neck of the balloon to be tied, one of the members having a longitudinal bore adapted to slidably receive the string, the bore being aligned parallel to said axis and opening adjacent the channel at an end of said one of the members, whereby the neck of the balloon is tied in a knot around and through the channel, and the knot slid easily from the apparatus onto the string.

4,510,654

HOLDER FOR FILTER BAGS FOR PREPARING TEA AND THE LIKE

Herbert Müller, Im Elm 24a, 5450 Neuwied 21, Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 509,857
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224355
Int. Cl.³ A44B *21/00*
U.S. Cl. 24—344 **3 Claims**



1. A holder having a generally oblong configuration for filter bags which are to be used in the preparation of tea and similar beverages; said holder comprising:

a clamping body including handles at each end of the oblong configuration and also including three legs which extend approximately parallel to one another in intermediate location between the handles at each end of the oblong configuration with one of said legs being a central leg having only one end connected with said clamping body and having a gripping means for retaining the tea bag filter therewith, and the other two legs being outer legs, one of which is disposed on each of the opposite longitudinal edges of said central leg; said two outer legs being preloaded relative to one another in such a way that said two outer legs can be brought into either one of two different stable end positions, namely an open position, and a closed position; in said open position, an angular aperture existing between said central leg on the one hand, and said outer legs on the other hand, with said central leg projecting out of a curved plane formed by said outer legs; in said closed position, a narrow slot-like opening existing between each of said longitudinal edges of said central leg, and the adjacent longitudinal inner edges of the adjacent outer legs;

a chain-like member having two ends, one of which is fastened to said clamping body at a location substantially centrally of one of said outer legs so that consequently said chain-like member engages substantially above center of gravity of said holder for filter bags used in preparation of tea and the like; and

a hook-like member connected to the other end of said chain-like member for fastening the latter to components of a brewing container.

4,510,655

SLIDE FASTENER ASSEMBLY FOR CASE OR FOLDER

Sadaho Asahi, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,517
Claims priority, application Japan, Jun. 18, 1982, 57-91106
Int. Cl.³ A44B *19/02*
U.S. Cl. 24—382 **2 Claims**

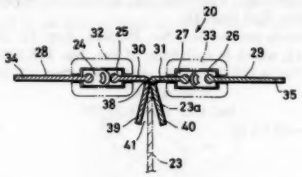
1. A slide fastener assembly for a case having a pair of outer walls and at least one intermediate wall, comprising:

(a) a plurality of laterally spaced pairs of rows of only single-headed coupling elements;

(b) a pair of outer tapes carrying, on their respective inner edges, outermost rows of said coupling elements and

adapted to be attached to the respective outer walls of the case; and

(c) a pair of L-shaped intermediate tapes having leg portions disposed between two adjacent pairs of said coupling element rows, and other leg portions transverse to and



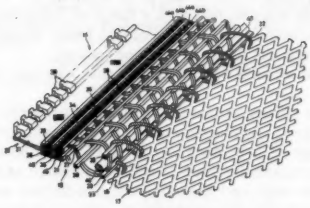
sewn to said first-named leg portions the latter carrying, on opposite longitudinal edges, respective inner rows of said adjacent two pairs of coupling element rows, said other leg portions of said intermediate tapes being adapted to be attached astride the intermediate wall of the case.

4,510,656

SLIDE FASTENER ASSEMBLY

Hiroshi Yoshida, Kurobe; Yoshio Matsuda, Nyuzen, and Akira Komeya, Kurobe, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Oct. 28, 1982, Ser. No. 437,293
Int. Cl.³ A44B *19/00*
U.S. Cl. 24—390 **13 Claims**



1. A slide fastener assembly for joining together a pair of confronting edges of net structure, comprising:

(a) a slide fastener having a pair of stringers; and

(b) a pair of warp-knitted net adapters having a number of rectangular meshes therein, each of said adapters including

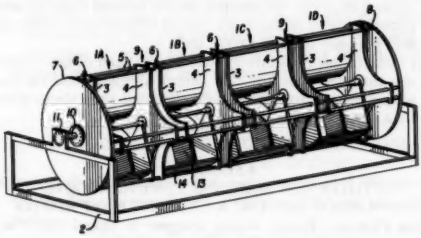
(c) a net transition region arranged for connection to one of the confronting edges of the net structure, and a pair of superimposed web regions connected to a longitudinal edge of said net transition region and jointly supporting one of said stringers, said net transition region having a first portion disposed remotely from said longitudinal edge, a pair of second portions extending adjacent to said web regions, and a pair of third portions extending between said first and said second portions, said third portions having a mesh size larger than that of said first and second portions, said web regions having a mesh size smaller than that of said first and second portions.

4,510,657

ROTATING CREEL FOR A NONWOVEN FABRIC MACHINE

Jean Curinier, and Philippe Pinet, both of Le Cheylard, France, assignors to Etablissements les Fils d'Auguste Chomarat & Cie, France

Filed Dec. 9, 1982, Ser. No. 448,328
Claims priority, application France, Dec. 23, 1981, 81 24346
Int. Cl.³ D04H *3/00*; B65H *49/00*
U.S. Cl. 28—100 **3 Claims**



1. A yarn creel device in combination with a means for producing a textile web characterized by yarns extending cross-wise with respect to the length of said web, said yarn creel device comprising:

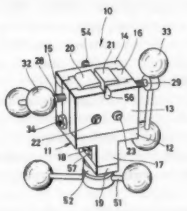
means for storing yarn feed bobbins, characterized by a plurality of rotating compartments wherein the feed bobbins are fixedly mounted inside said compartments by means of supporting cradles mounted within said compartments for free rotation about the same axis of rotation as the compartments, said cradles being immobilized by the actual weight of the feed bobbins.

4,510,658

CLAMPING UNIT

Kihei Takahashi, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jun. 29, 1982, Ser. No. 393,477
Claims priority, application Japan, Jun. 29, 1981, 56-95213[U]
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—33.2 **4 Claims**



1. A manually powered portable clamping apparatus for clamping a replacement slotted hollow body on a beaded edge, comprising:

(a) a recessed frame;

(b) a pair of opposite clamping arms pivotably disposed in said recessed frame and having a pair of clamping jaws at their upper end, respectively, for receiving the slotted hollow body with the beaded edge inserted therein;

(c) a pair of opposite manually movable threaded rods threaded through said recessed frame respectively against said clamping arms and longitudinally movable to reciprocate said clamping jaws toward and away from each other for forming and releasing the hollow body;

(d) a pair of opposite adjustable stops mounted on said re-

cessed frame for adjustably limiting the movement of said clamping jaws toward each other;

(e) a central presser slidably supported on said recessed frame and having an upwardly facing presser edge located between said clamping arms below said jaws for receiving thereon the slotted hollow body;

(f) a manually movable central threaded rod threaded through said recessed frame against said central presser and vertically movable to move said presser upwardly toward or downwardly away from said clamping jaws, whereby the slotted hollow body supported on said raised presser edge can be clamped on the beaded edge by said clamping jaws as manually forced toward each other by said opposite threaded rods; and

(g) three means respectively attached to each of said opposite threaded rods and said central threaded rod for enabling manual rotation of said threaded rods about their own axes to reshape said body.

4,510,659

METHOD FOR MANUFACTURING A VANE COMPRESSOR HAVING A LIGHTWEIGHT ROTOR

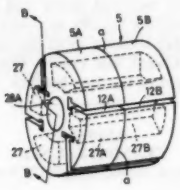
Michio Okazaki, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan

Division of Ser. No. 244,804, Mar. 17, 1981, Pat. No. 4,415,321. This application Mar. 25, 1983, Ser. No. 478,790

Claims priority, application Japan, Mar. 15, 1980, 55-36855

Int. Cl.³ B23P *15/04, 15/00*

U.S. Cl. 29—156.8 R **18 Claims**



1. A method of manufacturing a rotor for use in a vane compressor, comprising forming said rotor having a central through bore extending therethrough along an axis thereof and through which said rotary shaft extends, a plurality of axial slits formed in an outer peripheral surface thereof in a circumferentially spaced arrangement and extending along a whole length thereof and in which vanes are inserted, and a plurality of cavities formed between adjacent ones of said axial slits,

the forming method comprising:

preparing iron base metal powder containing copper;

charging said metal powder into a plurality of molds each having a predetermined cavity shape;

compressing said metal powder within said molds to form a plurality of green compacts each having a predetermined shape;

arranging said green compacts in an abutting manner so as to assume the shape of said rotor and simultaneously applying at least one brazing member to said green compacts along at least one abutting portion thereof;

heating said green compacts and said brazing member under a reducing atmosphere to a temperature higher than the melting point of said brazing member, to cause said green compacts to be integrally joined together to obtain an integral piece of sintered alloy compacts; and

finish grinding surfaces of said integral piece of sintered alloy compacts to form a finished rotor;

said rotor being formed with a back pressure chamber therein which intersects with said central through bore at an axially central portion thereof, said back pressure chamber having a diameter larger than that of said central through bore, and said plurality of axial slits having axially central portions thereof communicating with said back pressure chamber, said back pressure chamber also being in communication with said plurality of cavities.

4,510,660

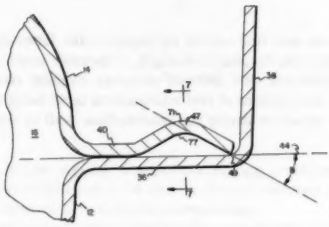
METHOD OF MANUFACTURING A TWO-PLATE HEAT EXCHANGER

Russell W. Hoeffken, Belleville, Ill., assignor to Snyder General Corporation, Red Bud, Ill.

Continuation-in-part of Ser. No. 295,041, Aug. 21, 1981, Pat. No. 4,441,241, which is a division of Ser. No. 178,338, Aug. 15, 1980, Pat. No. 4,298,061. This application Sep. 13, 1982, Ser. No. 417,672

Int. Cl.³ B21D *53/04*

U.S. Cl. 29—157.3 D **7 Claims**



1. A method of joining opposed sheet metal sections of a heat exchanger unit along an edge thereof wherein each of said sections is provided with a flange adapted to be joined to the cooperating flange of the other section, comprising the steps of:

forming a generally elongated continuous bead on the flange of one of said sections extending adjacent to an outer longitudinal edge of said flange of said one section by displacing a portion of said flange of said one section away from a plane coincident with said flange of said one section to form a ridge which is elastically displaceable by a portion of said flange of said other section;

forming said other section with a flange of sufficient width to permit folding said portion of said flange of said other section over the flange of said one section;

placing said sections opposite each other with said flanges aligned;

folding said portion of said flange of said other section over said flange of said one section and pressing said portion of said flange of said other section against said bead sufficiently to elastically displace said ridge toward said plane coincident with said flange of said one section and said longitudinal edge into engagement with said flange of said other section to form a seal between said flanges at said ridge and at said longitudinal edge.

4,510,661

APPARATUS FOR DISASSEMBLING A UNIVERSAL JOINT

Eddie L. Campa, 122 Shirley Ct., Colton, Calif. 92324

Filed Aug. 8, 1983, Ser. No. 520,892

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—259 **2 Claims**

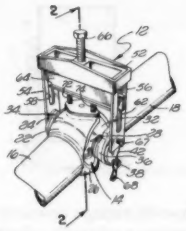
1. Apparatus for disassembling a universal joint formed of a first and second yoke, each yoke having a pair of yoke arms, said yokes each being connected to a shaft, each of said yokes being secured to a journal assembly by means of cap screws threaded into openings in said yoke arms comprising:

a generally U-shaped member having a base and a pair of arms each extending at one end from said base along generally parallel axes in the same direction from opposite ends of said base;

means for securing the other ends of said U-shaped member arms to the arms of one of said pair of yokes, respectively, comprising a threaded bolt insertable in said openings of said yoke arms of said first yoke when said cap screw is removed from said yoke arm openings;

a drive bar secured to said U-shaped member arms and movable with respect to said U-shaped member arms;

a pair of drive studs threadably positioned in said openings formed in an arm of said second yoke when its securing



cap screws are removed therefrom, said drive studs extending from said openings and being positioned adjacent said drive bar; and

means for moving said drive bar and said drive studs simultaneously comprising a bolt positioned in said base and movable generally parallel to the axes of said U-shaped arms for enabling movement of one of said yokes with respect to the other of said yokes along an axis parallel to the axes of said U-shaped member arms.

4,510,662

APPARATUS AND A METHOD FOR FORMING SPACE SECTIONS IN A SLIDE FASTENER CHAIN HAVING COUPLING ELEMENTS IN THE FORM OF CONTINUOUS COIL

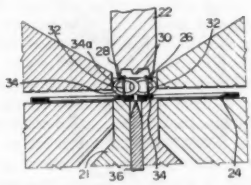
Masao Matsumoto, and Shigeru Imai, both of Toyama, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Dec. 23, 1982, Ser. No. 452,614

Claims priority, application Japan, Dec. 29, 1981, 56-197537[U]

Int. Cl.³ B21D *53/50;* A41H *37/06*

U.S. Cl. 29—408 **4 Claims**



1. An apparatus for forming spaced sections at predetermined intervals in a slide fastener chain having a pair of interengaged coupling elements in the form of continuous coil in which the predetermined span of the coupling elements secured to a pair of fastener tapes by sewing threads is cut and the coupling elements are pulled out of the sewing threads and removed therefrom, said apparatus comprising:

die means confronting the fastener tapes for supporting the slide fastener chain horizontally;

punch means disposed on the coupling elements side of said tape and being reciprocably movable toward the coupling elements, said punch means having at the end surface a pair of laterally spaced apart cutting edges for cutting the lateral outer side upper leg portion of the pair of interengaged coupling elements at the connecting reserved portion side of the sewing thread and a gripping projection disposed centrally between the pair of the cutting edges for pressing the upper leg portions adjacent the interengaging head portions of the interengaged coupling elements to flatten out the coupling elements being cut;

ejector means disposed in the die means reciprocably movable toward the gripping projection of the punch means, said punch means being upwardly movable in response to the upward movement of the ejector means while the upper leg portions adjacent to the interengaging head portions of the interengaged coupling elements is gripped between the edge of the ejector means and the gripping projection of the punch means to draw the flattened, cut coupling elements away from the sewing thread; and

means for holding the pair of fastener tapes.

4,510,663

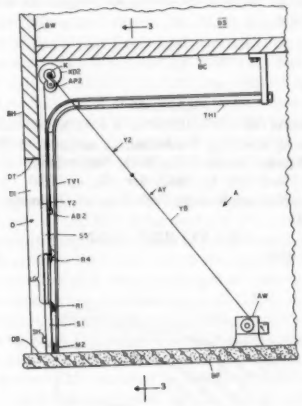
METHOD OF INSTALLING MULTI-SECTIONS VERTICALLY ACTING DOORS

Robert E. Friesz, Omaha, Nebr., assignor to Leo R. Murnan and Omaha Door Company, both of Omaha, Nebr., part interest to each

Filed Jan. 21, 1983, Ser. No. 459,770

Int. Cl.³ B21D *39/03;* B23P *11/00;* B66D *1/36*

U.S. Cl. 29—429 **4 Claims**



1. Method for installing a multi-sections vertically acting overhead type door for a vertically extending rectangular door opening of a building structural wall, said door opening having a floor as its horizontal bottom-border, a wall header as its horizontal top-border, and longitudinally separated and vertical left-border and right-border, said overhead type door comprising a plurality of vertically aligned and longitudinally horizontally extending upright sections pivotably attached together and including a bottom-section, a top-section, and a plurality of intervening medial-sections, said method comprising the following steps:

A. attaching vertical trackway lengths to the structural wall alongside the door opening left-border and right-border;

B. attaching longitudinally separated pulley support means to the wall header above the door opening;

C. providing a hoisting apparatus by: attaching a left-pulley and a right-pulley in removable condition to said pulley support means, engaging the left-length and the right-length of a Y-shaped liftcable with said left-pulley and right-pulley, engaging the liftcable base-length with a floor supported dual-directional winch means, and attaching left-bracket and right-bracket to depending portions of said liftcable left-length and right-length;

D. positioning the door bottom-section uprightly at the door

opening bottom-border and into rollable engagements with the vertical trackway lengths;

E. uprightly suspending the door top-section from the left-bracket and right-bracket terminii of said hoisting apparatus, said top-section being in rollable engagement with said vertical trackway lengths;

F. hoisting the top-section a lofty-gap above said uprightly positioned bottom-section;

G. positioning the door uppermost medial-section uprightly upon said bottom-section and pivotably attach and medial-section to the top-section, said uppermost medial-section being in rollable engagement with the vertical trackway lengths;

H. hoistably suspending the top-section and pivotably attached uppermost medial-section a lofty-gap above said uprightly positioned bottom-section;

I. positioning the door next lower medial-section uprightly upon said bottom-section and pivotably attach said medial-section to the medial-section thereabove, said next lower medial-section being in rollable engagement with the vertical trackway lengths;

J. repeating steps H and I in order, and terminating with the lowermost medial-section in said suspended condition; and

K. pivotably attaching said uprightly positioned bottom-section to the lowermost suspended medial-section, and removing the left-bracket and right-bracket from the door top-section.

4,510,664

METHOD OF PRODUCING A PACKING RING

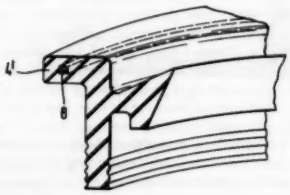
Pieter J. Lock, Koelweg, Netherlands, assignor to Rubber-en Kunststoffabriek ENBI B.V., Nuth, Netherlands

Filed Feb. 18, 1983, Ser. No. 467,928

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, 3206677

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—450 **3 Claims**



1. The method of producing an annular or other configuration packing ring which comprises the steps of forming a length of elastomeric material having uniform cross-sectional configuration corresponding to the desired cross-section of the packing ring, said length corresponding substantially to the circumferential extent of said ring, said length including a lengthwisely extending cavity, providing a length of wire corresponding generally to the length of the cavity in said length of elastomeric material, said wire being relatively rigid as compared to said elastomeric material and having cross-sectional configuration sized to be intimately received in said cavity, bending said wire to a desired configuration, thereafter introducing said wire into said cavity, to thereby cause said length of elastomeric material to be deformed into said annular or other configuration, causing the free ends of said wire to be mutually interconnected and thereafter causing the free ends of said length of elastomeric material to be juxtaposed in abutting relation.

4,510,665

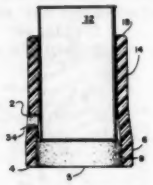
CONTAINER INSULATION APPARATUS

Stephen M. Scheurer, Wichita Falls, Tex., assignor to Texas Recreation Corporation, Wichita Falls, Tex.

Continuation of Ser. No. 217,922, Dec. 18, 1980, abandoned, and Ser. No. 69,146, Aug. 23, 1979, abandoned. This application Apr. 18, 1983, Ser. No. 486,044

Int. Cl.³ B23P *3/00, 19/04*

U.S. Cl. 29—460 **16 Claims**



1. A method of manufacturing a container insulation apparatus comprising wrapping a generally cylindrical sheet element around a cylindrical base in one end of the element, securing an outer cylindrical surface of the base to a corresponding inner surface of the cylindrical element, securing edges of said sheet element to form a longitudinal seam forming a recessed annular space adjacent the base, coating exposed surfaces of the base and the cylindrical element and forming an opening through the container insulation apparatus in a portion thereof near the base.

4,510,666

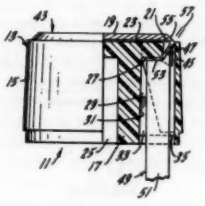
KNOB WITH DECORATIVE END CAP AND METHOD OF MANUFACTURING IT

Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigoleit Company, Decatur, Ill.

Continuation of Ser. No. 439,330, Nov. 5, 1982, abandoned. This application Aug. 31, 1984, Ser. No. 646,046

Int. Cl.³ B21D *39/00*; B23P *11/00*

U.S. Cl. 29—511 **7 Claims**



5. A method for fastening a decorative disc shaped end cap to a tubular knob body including the steps of:

forming the decorative disc shaped end cap with a depending skirt,

positioning the cap on one end of the tubular body with the skirt extending into an annular groove formed in one end of the tubular body,

inserting a bending tool with at least one bending finger into the tubular body from the opposite end thereof into engagement with the depending skirt, and

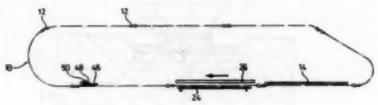
deforming the depending skirt with the bending finger in at least two spaced locations to lock the cap to the tubular body.

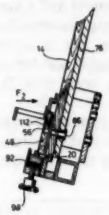
4,510,667

PROCESS FOR PRE-SETTING MOUNTING HOLES FOR CUTTING AND EJECTION TOOLS OF AN AUTOMATIC PLATEN PRESS

Jacques Nassoy, 14, rue Capitaine, Dumont, St. Quentin, and Bernard Protin, 3, ch. Croix Etienne, F-21600 Senaay, both of France

Filed Feb. 3, 1982, Ser. No. 345,354
Claims priority, application France, Feb. 3, 1981, 81 02006
Int. Cl.³ B23P 19/00
U.S. Cl. 29—526 R 5 Claims





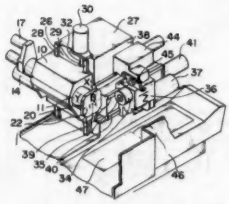
1. A method for presetting mounting holes for cutting and ejection tools of an automatic platen press, which tools are used for cutting cardboard box blanks in sheets and to strip waste therefrom, said cutting tool being a cutting form made up of a wooden board, which on one face has a plurality of cutting rules and creasing rules arranged in a pattern, said ejection tools including a first ejection board of the same dimension as the cardboard box blank being produced and a second ejection board of the same dimension as the part of the sheet acting as a gripping engagement by which the sheet is seized in order to be moved from one tool to the other in the press, said method comprising the steps of providing a premounting template having means for longitudinal positioning of the tools on the template, which means is identical to the corresponding means for mounting each of the tools in the press, said template having a plurality of holes disposed in a distribution identical to that of the corresponding means for mounting of the press; positioning the cutting form on the template; drilling at least one centering hole and a series of mounting holes in the cutting form by using the holes in the template to guide the drill bit; positioning one of the first and second ejection boards on the template in alignment with the cutting form; then drilling at least one centering hole in said one board by drilling through the centering hole of the cutting form and then drilling mounting holes in said one board; removing the one board and positioning the other of the first and second ejection boards on the template in alignment with the cutting form; and then forming at least one centering hole in said other board by drilling through each centering hole of the cutting form and then forming mounting holes in said other board.

4,510,668

MACHINING CENTER

Kenichi Ishida, Nagaoka, and Tetsuro Takahashi, Ojiya, both of Japan, assignors to Tsugami Corporation, Japan

Filed May 3, 1982, Ser. No. 374,510
Claims priority, application Japan, May 13, 1981, 56-70673; Dec. 11, 1981, 56-198467
Int. Cl.³ B23Q 5/22
U.S. Cl. 29—561 6 Claims



1. A machining center comprising a vertical bed (27) having a first vertical surface (26) and a second vertical surface (38) at right angles to said first vertical surface (26), a pallet slide (10), first means (28, 29, 30, 32, 33) connecting said pallet slide (10) for vertical movement on said first vertical surface (26), a spindle slide (36), second means (30, 40, 41, 42, 43) connecting said spindle slide (36) for horizontal movement on said second vertical surface (38), a supporting shaft (11) having a first horizontal axis (Y) parallel to said first vertical surface (26) connected to said pallet slide (10) for axial movement along said first horizontal axis (Y), means (12, 13, 14) to axially move said supporting shaft (11) along said first horizontal axis (Y), an indexing shaft (15) connected coaxially in said supporting shaft (11) and for shifting movement in the direction of said first horizontal axis (Y), means (18) to shift said indexing shaft (15) in the direction of said first horizontal axis (Y), coupling means (19) between said supporting shaft (11) and indexing shaft (15) engaged to connect said shafts when the indexing shaft (15) is shifted in one direction and disengaged to release said shafts from each other when the indexing shaft (15) is shifted in the other direction, transmission means (16) connected to rotate said indexing shaft (15) relative to said supporting shaft (11) when said indexing shaft (15) is shifted in said other direction, a clamping shaft (23) included in and axially shiftable in the direction of said first horizontal axis (Y) in said indexing shaft (15) between two positions, means (24) to shift said clamping shaft (23) between said two positions, a clamping plate (21) connected on the end of the clamping shaft (23) toward said spindle slide (36), a pallet (20) having a vertical pallet surface (22) for carrying a workpiece removably engageable with said clamping plate (21), a positioning coupling (25) engaged between said pallet (20) and indexing shaft (15) in one of said two positions of said clamping shaft (23) and released in the other of said two positions of said clamping shaft (23) for removal of said pallet (20) from said clamping plate (21), a spindle (34) for carrying a tool connected in said spindle slide (36) for rotation about a second horizontal axis (Z) disposed at right angles with said first horizontal axis (Y), said second horizontal axis (Z) positioned parallel with said second vertical surface (38), whereby said pallet is axially movable along said first horizontal axis (Y) by said means (12, 13, 14) to axially move said supporting shaft (11), by said means (18) to shift said indexing shaft (15) and by said means (24) to shift said clamping shaft (23), and is rotatable about said first horizontal axis by said transmission means (16) for indexing, said first horizontal axis is movable in a vertical plane, said spindle is rotatable about and axially shiftable along said second horizontal axis (Z), and a wide space is formed beneath the machining position for a workpiece.

4,510,669

REPLACEABLE GANG HEAD MACHINE TOOL

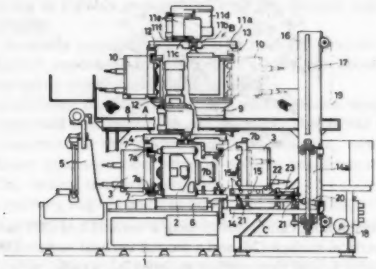
Jinsei Ida, Sayama; Tsutomu Fujita, Kawagoe; Ichiho Yamada, Kawagoe; Fumio Higuchi, Kawagoe, and Kenzaburo Matsuo, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1982, Ser. No. 435,879

Claims priority, application Japan, Oct. 21, 1981, 56-167022; Oct. 23, 1981, 56-168807

Int. Cl.³ B23Q 3/157

U.S. Cl. 29—568 5 Claims



1. A replaceable gang head machine tool including a machine base, a working unit thereon, plural gang heads on the periphery of the working unit, and an index table on the upper side of the working unit for selecting any desired one of the gang heads, further comprising a supporting base positioned above the machine tool, stock means mounted on said supporting base and comprising a center support, plural gang heads on the periphery of the center support, and an index table on the upper side thereof for selecting any desired one of the gang heads, and a replacing means positioned away from said machine tool and the stock means extending between the machine tool and the stock means for effecting a replacement between the gang heads on the machine tool and the gang heads on the stock means, the replacing means comprising an elevating table which is moveable upwards and downwards between a lowered position facing the stock means, a supporting table which is extendable towards an index position for the gang head positioned on one side of the periphery of the machine tool and serves to support the gang head at that index position from below, means for extending the support table, the supporting table being supported separately moveably upwards and downwards on the elevating table so as to be given a stroke of upward and downward movements necessary for attaching and detaching of the gang head to and from each of the machine tool and the stock means, and means for separately moving the support table up and down on the elevating table.

4,510,670

METHOD FOR THE MANUFACTURE OF INTEGRATED MOS-FIELD EFFECT TRANSISTOR CIRCUITS SILICON GATE TECHNOLOGY HAVING DIFFUSION ZONES COATED WITH SILICIDE AS LOW-IMPEDANCE PRINTED CONDUCTORS

Ulrich Schwabe; Franz Neppl, and Konrad Hieber, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 17, 1983, Ser. No. 458,533

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211761

Int. Cl.³ H01L 21/285

U.S. Cl. 29—571 14 Claims

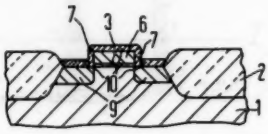
1. A method for the manufacture of integrated MOS field effect transistor circuits in silicon gate technology, in which diffused zones are rendered low-impedance by use of a layer lying thereon in physical contact therewith comprised of a metal silicide having a high melting point, and which are useful as printed conductors, comprising the steps of:

producing insulation regions on a surface of a silicon substrate to define an active transistor region with source and drain zones, and providing an insulating layer for a gate above the active region;

providing a polysilicon gate above the gate insulating layer and providing an insulation layer on side-walls of the gate;

providing the source and drain zones in the substrate;

producing by use of the previously provided insulation layers in self-adjusting fashion without deposition occurring on the insulation layers a metal silicide layer in direct



contact with and only on the source and drain zones and gate comprised of silicon through selective deposition from a gas phase and by use of a reaction gas mixture having a silane compound and a metal halide along with a hydrogen halide during thermal decomposition, a crystal nucleus formation in the insulation layers being suppressed so that etching is not needed;

providing an insulating layer over the metal silicide layer; and

providing appropriate exterior contact printed conductors which are in contact with a portion of the metal silicide layer where necessary through holes selectively etched in the oxide layer.

4,510,671

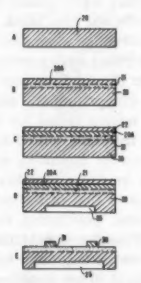
DIELECTRICALLY ISOLATED TRANSDUCER EMPLOYING SINGLE CRYSTAL STRAIN GAGES

Anthony D. Kurtz, Englewood; Timothy A. Nunn, Ridgewood, and Joseph R. Mallon, Franklin Lakes, all of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Division of Ser. No. 298,275, Aug. 31, 1981, Pat. No. 4,456,901. This application Nov. 21, 1983, Ser. No. 537,100

Int. Cl.³ H01L 29/84; G01L 1/22

U.S. Cl. 29—571 7 Claims



1. A method of fabricating a semiconductor transducer comprising the steps of:

ion-implanting high doses of oxygen in a single crystal semiconductor wafer surface to form a buried silicon dioxide layer;

epitaxially growing an additional layer of silicon on the implanted surface of said wafer to form a composite single crystal layer with said implanted surface included,

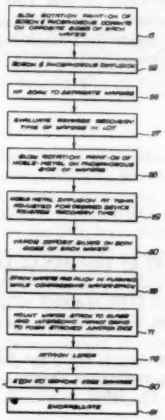
forming a gage pattern on the composite single layer including said implanted surface of said wafer to provide a single crystal gage configuration.

4,510,672

PROCESS FOR MAKING STACKED HIGH VOLTAGE RECTIFIERS

John Yakura, Visalia, Calif., assignor to California Linear Circuits, Inc., La Mirada, Calif.

Filed Sep. 23, 1982, Ser. No. 421,811
Int. Cl.[3] H01L *21/225, 21/50, 21/68, 25/08*
U.S. Cl. 29—574 **6 Claims**



1. In a process for making stacked high voltage rectifiers, the improvement comprising:

coating each of a plurality of silicon wafers with paint-on P-type and N-type dopants respectively on opposite sides of each wafer, said coating being carried out by:

slowly rotating the wafer at a speed of less than about twenty revolutions per minute while said wafer is supported at its edge, in a horizontal plane, by a set of radially widely spaced support fingers,

applying one of said dopants with an applicator that is gradually moved from the center to the outer edge of one side of said wafer while said wafer is being slowly rotated,

repeating said slowly rotating and applying steps with the wafer inverted, for applying the other of said dopants to the opposite side of said wafer,

said slow rotation limiting spin-off and runover of each dopant onto the reverse side of said wafer, and

thereafter tightly coin stacking a plurality of wafers, each coated in accordance with the preceding steps, with similary doped sides facing each other, and diffusing said wafers by heating said tightly coin stacked wafers in a diffusion furnace.

4,510,673

LASER WRITTEN CHIP IDENTIFICATION METHOD

Alan J. Shils, Yorktown Heights, and John P. Ianni, Jr., Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1983, Ser. No. 507,311
Int. Cl.[3] H01L *21/66*
U.S. Cl. 29—574 **10 Claims**

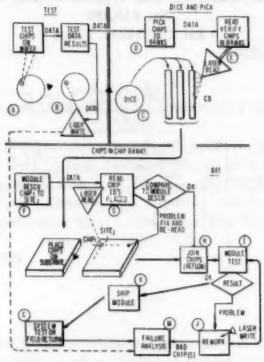
1. A method of producing a semiconductor device comprising the steps of:

providing a plurality of semiconductor chips on a wafer and testing said chips on said wafer to determine their useability;

writing on each chip identification data that may be read by a human or a machine;

dicing said wafer to separate said chips;

selecting and placing said chips into a storage device and reading said identification data to verify the proper location and orientation of said chips in said storage device;



removing said chips from said storage device and placing said chips on a substrate;

reading said identification data to verify the correct location and orientation of each chip on said substrate and, if incorrect, re-locating and/or re-orienting said chip; and

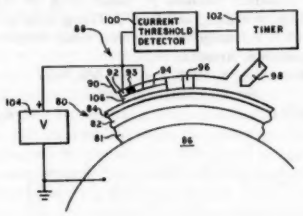
joining said chips to said substrate.

4,510,674

SYSTEM FOR ELIMINATING SHORT CIRCUIT CURRENT PATHS IN PHOTOVOLTAIC DEVICES

Masatsugu Izu, Southfield, and Vincent D. Cannella, Detroit, both of Mich., assignors to Sovonics Solar Systems, Solon, Ohio

Division of Ser. No. 435,890, Oct. 21, 1982, Pat. No. 4,451,970.
This application Mar. 23, 1984, Ser. No. 592,610
Int. Cl.[3] H01L *21/306, 31/18*
U.S. Cl. 29—574 **19 Claims**



1. A system for eliminating a short circuit current path through a photovoltaic device of the type including at least one active semiconductor region overlying a substrate and a layer of transparent conductive material overlying said at least one active region, said short circuit current path extending from the substrate through the semiconductor region to said transparent conductive layer, said system comprising means for detecting the location of said short circuit current path and means for increasing substantially the resistivity of said short circuit current path selectively at the interface between said transparent conductive material and said semiconductor region.

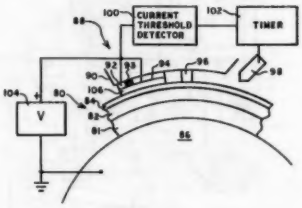
4,510,675
SYSTEM FOR ELIMINATING SHORT AND LATENT SHORT CIRCUIT CURRENT PATHS IN PHOTOVOLTAIC DEVICES

Masatsugu Izu, Birmingham, and Vincent D. Cannella, Detroit, both of Mich., assignors to Sovonics Solar Systems, Solon, Ohio

Division of Ser. No. 520,054, Aug. 3, 1983, Pat. No. 4,464,823, which is a continuation-in-part of Ser. No. 435,890, Oct. 21, 1982, Pat. No. 4,451,970. This application May 14, 1984, Ser. No. 610,198

Int. Cl.³ H01L *31/18*

U.S. Cl. 29—574 **16 Claims**



1. A system for actuating potential short circuits and then eliminating the actuated and existing short circuit current paths through a photovoltaic device of the type including a semiconductor region overlying a substrate having an interface surface opposite said substrate and a layer of transparent conductive material overlying said semiconductor region interface surface, said potential and existing short circuit current paths extending from the substrate through the semiconductor region to said interface surface, said system comprising:

bias means for applying a bias to said device to convert latent potential short circuits to existing short circuit current paths;

detecting means for detecting the location of said short circuit current paths; and

resistivity increasing means for increasing substantially the resistivity of said short circuit current paths selectively at the interface surface of said semiconductor region.

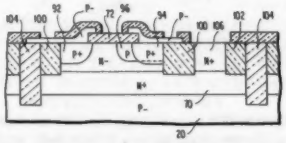
4,510,676
METHOD OF FABRICATING A LATERAL PNP TRANSISTOR

Narasipur G. Anantha; Santosh P. Gaur, both of Hopewell Junction; Yi-Shiou Huang, and Paul J. Tsang, both of Poughkeepsie, all of N.Y., assignors to International Business Machines, Corporation, Armonk, N.Y.

Filed Dec. 6, 1983, Ser. No. 558,740

Int. Cl.³ H01L *21/265*

U.S. Cl. 29—577 C **4 Claims**



1. A method for making an asymmetrical lateral PNP transistor having a graded collector junction simultaneously with the process steps for making NPN transistors and P-type resistors, comprising the steps of:

forming a semiconducting region into which said PNP and NPN transistors and said resistors are to be formed, by forming said semiconducting region containing isolated N^+ regions and overlying N^- regions;

forming at least one P^- region, simultaneously with forming said resistors, one of said P^- layers being adjacent a portion of one of said N^- regions to define a collector-base junction of said PNP transistor;

forming a first P^+ region, simultaneously with forming bases of said NPN transistors, adjacent another portion of said N^- region to define an emitter-base junction of said PNP transistor;

forming a second P^+ region substantially to the depth of said P^- region, simultaneously with forming said first P^+ region, adjacent said P^- region for establishing a collector contact region of said PNP transistor; and

forming an N^+ region, simultaneously with forming collector reach-throughs of said PNP transistors, extending from the surface of said semiconducting region to said isolated N^+ region for establishing a base contact region of said PNP transistor.

4,510,677
CASES WITH FLAT TERMINAL LUGS FOR MEDIUM POWER SEMI-CONDUCTOR COMPONENTS AND A PROCESS FOR MANUFACTURING SAME

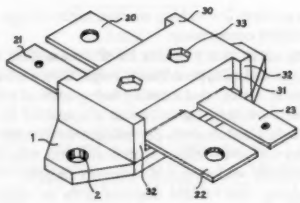
Yoland Collumeau, Paris, France, assignor to Thomson CSF, Paris, France

Filed Apr. 1, 1982, Ser. No. 364,207

Claims priority, application France, Apr. 8, 1981, 81 07035

Int. Cl.³ H01L *23/10, 23/12, 23/02*

U.S. Cl. 29—588 **5 Claims**



1. A process for manufacturing a case for encapsulating power semiconductor components, said case including a metal base having two parallel sides, at least one semiconductor component mounted on said base, said component having connecting lugs in the form of small metal plates projecting beyond the edges of said parallel sides of the base, said process comprising the following steps:

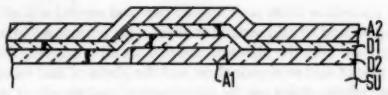
molding plastic material onto the metal base allowing said plastic material to surround and encapsulate the semiconductor components and a proximal part of each lug, so as to form a block of plastic material having lateral walls from which protrudes a flat distal part of each lug, said block totally surrounding the lugs at the places where they protrude therefrom, said lateral walls of said block each having a lower portion below the lugs and an upper portion above the lugs, said lower portion being formed normal to the metal base and flush with said parallel sides of the metal base between the metal base and the lugs, said upper portion being recessed with respect to the edges of said metal base, said recess extending the entire height of the lateral walls above the lugs, and

cutting and shaping said lugs in accordance with a chosen pattern subsequent to molding said block.

4,510,678
METHOD FOR MANUFACTURING A MONOLITHICALLY INTEGRABLE CIRCUIT WITH A MULTILAYER WIRING STRUCTURE

Harald Eggers, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 28, 1983, Ser. No. 518,144
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228399
Int. Cl.³ H01L *21/90, 21/94*
U.S. Cl. 29—590 **5 Claims**

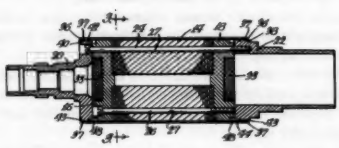


1. Method of manufacturing a monolithically integrable circuit, which comprises depositing an SiO_2 layer on the surface of a semiconductor substrate containing p-n junctions of the circuit, at least partially covering the SiO_2 layer with a first metallization supported by the SiO_2 layer and containing conductor runs and electrodes capacitively coupled to the surface of the semiconductor substrate through the SiO_2 layer, directly covering the first metallization with a sputtered-on SiO_2 insulating layer after the first metallization is completed, covering the sputtered-on SiO_2 layer with a further inorganic insulating layer generated by the plasma method, structuring the further inorganic insulating layer and the sputtered-on SiO_2 layer, forming cutouts in the further inorganic insulating layer and the sputtered-on SiO_2 layer above intended contact locations of the first metallization, applying a second metallization to the surface of the further inorganic insulating layer after completing the first metallization, the sputtered-on SiO_2 layer and the further inorganic insulating layer, bringing the second metallization into electrical contact with the contact locations of the first metallization through the cutouts, and forming the second metallization into conductor runs.

4,510,679
METHOD OF REFURBISHING A HIGH SPEED ROTOR

Mohd A. Aleem, Roscoe; James L. Lobsinger, and Jerry D. Wefel, both of Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 17, 1983, Ser. No. 523,923
Int. Cl.³ H02K *15/14*
U.S. Cl. 29—598 **10 Claims**

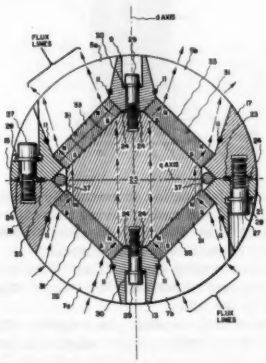


1. A method of removing a protective can disposed over a core subassembly having a peripheral outer surface and a rotational axis comprising the steps of:
providing at least one relief in the peripheral outer surface of the core subassembly;
cutting the can along the relief to define at least one access section;
said relief permitting extension of a cutting means entirely through the can and accommodating the cutting means so that the cutting means will not damage the core subassembly; and
removing the access section to expose the core subassembly so that the core subassembly can be repaired or refurbished.

4,510,680
METHOD OF MAKING A PERMANENT MAGNET ROTOR

Timothy J. E. Miller, Schenectady; Donald W. Jones, Burnt Hills, and Gary L. Kalan, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 453,666, Dec. 27, 1982, Pat. No. 4,480,207.
This application Dec. 5, 1983, Ser. No. 558,211
Int. Cl.³ H02K *15/02*
U.S. Cl. 29—598 **6 Claims**

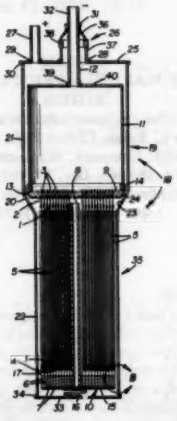


1. A method of assembling a permanent magnet rotor comprising the steps of:
rigidily securing a central nonmagnetic insert between two arcuately shaped sections of a north pole piece;
rigidly securing another central nonmagnetic insert between two arcuately shaped sections of a south pole piece;
rigidly securing a nonmagnetic segment to each end of each of said north and south pole piece sections not secured to said central inserts, respectively, to form two half rings;
surrounding the central portion of a shaft of magnetic material with the two half rings, the central portion of the shaft having a substantially rhombic cross section, one corner of said substantially rhombic shaped shaft central portion adjacent one central nonmagnetic insert and the diagonally opposite corner of said shaft central portion adjacent the other central nonmagnetic insert;
adjusting the clearance between said shaft and said central inserts to a predetermined value and adjusting the clearance between adjacent nonmagnetic segments to a predetermined value by machining or shimming the junction of said nonmagnetic segments;
joining said ring halves together;
affixing said central inserts to said shaft;
inserting magnetized permanent magnets into axially extending apertures formed between said shaft faces and the inner faces of said half rings; and
securing end rings at either axial end of said pole pieces to hold said magnets in their apertures.

4,510,681
HIGH TEMPERATURE BATTERY CELL COMPRISING STRESS-FREE HOLLOW FIBER BUNDLE

Joginder N. Anand, Clayton; Timothy T. Revak, and Frank J. Rossini, both of Concord, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 939,156, Sep. 1, 1978, Pat. No. 4,332,868.
This application Jan. 11, 1982, Ser. No. 338,759
Int. Cl.³ H01M 26/02
U.S. Cl. 29—623.1 4 Claims



1. A process for fabricating an essentially stress-free battery cell comprising a closed casing having two external electrical terminals and an inner assembly disposed within said casing and electrically connected to said terminals,

said process comprising steps I, II and III as defined below, step I being carried out and then one of steps II and III, followed by the other;

I. providing, as said assembly, an assembly which includes (1) a plurality of hollow fibers adapted to function as the electrolyte/separator in a battery cell and (2) an element incorporated in and extending from said assembly and engaged with said casing to provide the sole support and positioning of the assembly within the casing so that the assembly does not otherwise contact the casing in a manner which imposes a potentially damaging stress on any part of the assembly or which will result in such stressing if thermally induced dimensional changes occur in the assembly;

II. so engaging said element with said casing, and

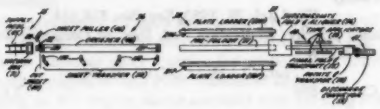
III. forming a separate, electrical connection from each of said terminals to said assembly, at least one of the connections comprising a limp link and each terminal connected to said assembly by a limp link not being connected by any non-limp member to said assembly.

4,510,682
APPARATUS AND METHOD FOR ASSEMBLING BATTERY CELL ELEMENTS

Anthony Sabatino, St. Paul; Edward G. Schaumburg, Askov; Peter A. Recht, Minneapolis; Douglas J. Olszewski, Inver Grove Heights, and Richard T. Strait, St. Paul, all of Minn., assignors to GNB Batteries Inc., Mendota Heights, Minn.

Filed May 24, 1982, Ser. No. 381,227
Int. Cl.³ H01M 6/00; B23P 19/00
U.S. Cl. 29—623.1 59 Claims

1. A method of assembling battery cell elements comprising the steps of positioning a first set of electrode plates of common polarity in a predetermined longitudinal array, positioning an elongated separator sheet over said first set of plates without affixing said plates to said separator sheet with permanent attaching means, positioning a second set of electrode plates of common polarity opposite to that of said first set onto said separator sheet in a predetermined longitudinal array without affixing said second set of plates to said separator sheet with permanent attaching means, and folding said separator sheet

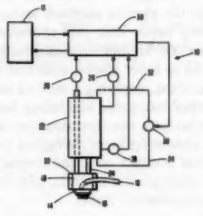


into accordion folds without said first and second sets of plates being affixed to said separator sheet with permanent attaching means and with the plates of said first set all occupying folds on one side of said separator sheet and the plates of said second set all occupying folds on the other side of said sheet.

4,510,683
FORCE ASSEMBLER APPARATUS FOR ROBOTS

George A. Fedde, Perkiomenville, and Kenneth H. Kirk, Harleysville, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Oct. 27, 1983, Ser. No. 546,148
Int. Cl.³ B23P 21/00; B23Q 15/00
U.S. Cl. 29—701 6 Claims



1. Force assembler apparatus for robots comprising:

a movable slide member;

a bi-directional actuator connected to the slide member;

microprocessor means programmable for controlling insertion force independent of distance moved by the slide member;

position indicator means connected to the slide member and coupled to send slide member distance signals and velocity information to the microprocessor;

pressure transducer means connected to the bi-directional actuator and coupled for sending signals to the microprocessor; and

supply valve means connected to the bi-directional actuator and coupled for receiving signals from the microprocessor in response to the position indicator signals and pressure transducer signals.

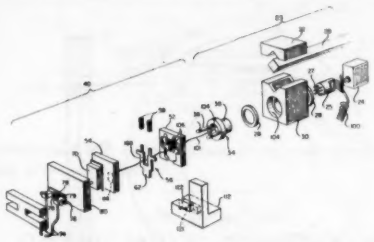
4,510,684
ROBOT TOOL SYSTEM

Burleigh M. Hutchins, Hopkinton, and Louis Abrahams, Worcester, both of Mass., assignors to Zymark Corporation, Hopkinton, Mass.

Filed Dec. 8, 1981, Ser. No. 328,727
Int. Cl.³ B23P 11/00
U.S. Cl. 29—703 6 Claims

1. A tool assembly apparatus for use in connection with a robot, said tool comprising (1) a robot connector subassembly permanently attached to an arm of said robot and (2) a tool; said tool assembly comprising means to automatically connect

and disconnect, both mechanically and electrically, said tool from said permanently attached subassembly in response to relative movement of said tool and said robot arm, and code



means positioned on said tool to communicate information specific to its identity and condition from said tool, through said robot.

4,510,685

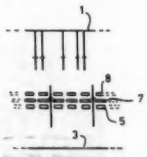
METHOD OF ASSEMBLING MAGNETIC PINS INTO PRINTED CIRCUIT BOARDS

Richard Chu, Charlotte, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1983, Ser. No. 563,328

Int. Cl.³ H05K *3/30*

U.S. Cl. 29—837 **6 Claims**



1. A method of assembling asymmetrically preswaged pins into a pattern of perforations in a printed circuit board, each perforation in the printed circuit board being of such a size that the shank of a pin is a free fit therein but the swage of the pin will not pass into the perforation, the method comprising the successive steps of:

(a) providing a sheet of magnetic material having a pattern of perforations corresponding to the pattern of perforations in the printed circuit board, each perforation in the sheet of magnetic material allowing free passage of the shank of a pin therein;

(b) placing the printed circuit board over the perforated sheet of magnetic material so that the perforations in the printed circuit board are aligned with the perforations in the sheet of magnetic material, the distance between the lower surface of the sheet of magnetic material and the upper surface of the printed circuit board being arranged to be substantially equal to or greater than the distance between the swage on each pin and the end of the pin closer to the swage and less than the distance between the swage on each pin and the end of the pin further from the swage;

(c) placing on top of said circuit board a template provided with a pattern of perforations corresponding to a particular pin pattern for said circuit board with the perforations in said template aligned with those in said circuit board;

(d) scattering pins over the template;

(e) generating a first magnetic field generally perpendicular to the printed circuit board so that the pins are aligned with the lines of force of the magnetic field, the strength of the first magnetic field being sufficient to align the pins but insufficient to levitate the pins so that the pins drop into the perforations in the printed circuit board;

(f) generating a second magnetic field generally perpendicular to the printed circuit board of such a strength and direction that the pins which are oriented so that their shanks do not extend beyond the lower surface of the sheet of magnetic material are ejected from the printed circuit board;

and repeating steps (e) and (f) until there is in essentially each of the perforations in the printed circuit board corresponding to the perforations in the perforation pattern in the template, a pin oriented so that its shank extends beyond the lower surface of the sheet of magnetic material.

4,510,686

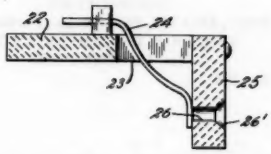
METHOD AND APPARATUS FOR STRAIGHTENING AND ALIGNING LEADS AND TESTING ELECTRICAL FUNCTIONING OF COMPONENTS

James E. Foster, Endwell, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Apr. 11, 1983, Ser. No. 483,700

Int. Cl.³ H05K *3/30;* **B23P** *19/00;* **B21F** *1/07*

U.S. Cl. 29—838 **14 Claims**



1. An automated method of sequentially handling electrical components of the type having a body and a single row of in-line leads projecting from said body, each of said leads having a longitudinal axis said method comprising the steps for each of said components of:

mechanically straightening each of said leads which is bent along said axis while aligning said leads substantially parallel to each other in a row; and

testing electrical functioning of said component substantially simultaneously with said straightening and aligning.

10. An apparatus for performing an automated method of sequentially handling electrical components having a body and leads projecting from said body, each of said leads having a lead axis, said apparatus comprising:

means for straightening and aligning said leads substantially parallel to each other each of said leads which are bent along each axis; and

means, operatively associated with said straightening and aligning means, for testing electrical functioning of said component substantially simultaneously with said straightening and aligning.

4,510,687

SHAVING APPARATUS

Gerrit J. Groothuis; Atze de Haan; Hendrik Poel; Eduard W. Tietjens, and Jochem J. de Vries, all of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,425

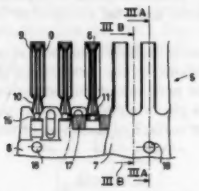
Claims priority, application Netherlands, Jan. 13, 1982, 8200101

Int. Cl.³ B26B *19/42*

U.S. Cl. 30—34.2 **2 Claims**

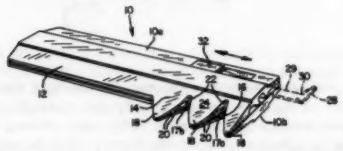
1. A shaving apparatus comprising a shear plate with hair-entry apertures; a cutting unit associated with and reciprocatory relative to the shear plate, said cutting unit including a frame; cutters extending from said frame toward the shear plate, each cutter having a trapezoidal cross section and being

in contact along its base with the shear plate; two hair-pulling blades respectively associated with and movable relative to the opposite sloping sides of each cutter, each hair-pulling blade normally being in contact at one end with the shear plate; and a pair of resilient arms connecting the respective other ends of



the hair-pulling blades to the frame, said resilient arms extending transversely of the direction of movement of the cutting unit and being arranged substantially in line with each other, the ends of the arms nearer one another being supported on a central portion of the frame, the other end of each arm engaging a hook-shaped portion of the frame.

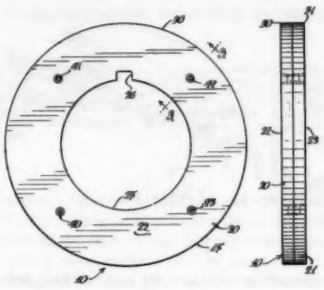
4,510,688
SEAM RIPPER
Leola E. White, 6811 SW. Florence La., Portland, Oreg. 97223
Filed Jul. 8, 1983, Ser. No. 511,764
Int. Cl.³ B26B *27/00*
U.S. Cl. 30—294 **6 Claims**



1. A cutting tool comprising a holder and a blade, the forward edge of said holder having at least one V-shaped notch for exposing a portion of the cutting edge of said blade, said blade edge extending across said notch perpendicular to a line bisecting its vertex and deeply recessed within said notch, said holder having a guide portion with upper and lower substantially planar surfaces obliquely disposed with respect to the plane of said blade, wherein the planes of said surfaces converge in a line disposed transversely forwardly of the blade so that said surfaces form a wedge to separate materials sewn together by a seam prior to engagement of said seam by said blade when said tool is moved along said seam with said blade oriented substantially perpendicular thereto, wherein said V-shaped notch includes a pair of inner walls whose planes intersect with the planes of said upper and lower holder surfaces, further including a plurality of beveled surfaces extending along a portion of the juncture between said upper and lower surfaces and said inner walls adjacent the vertex of said notch.

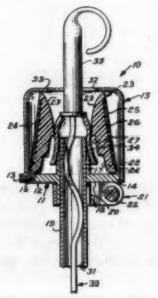
4,510,689
SIDE TRIMMER KNIFE
Julius Lorince, Crete, Ill., assignor to Modern Machine and Grinding, Inc., Dyer, Ind.
Filed Jun. 23, 1983, Ser. No. 507,280
Int. Cl.³ B26B *25/00*
U.S. Cl. 30—347 **8 Claims**

1. A side trimmer knife having a body with a pair of opposite exposed faces comprising, two juxtaposed cylindrical disks each having one of said faces, a cutting edge defined by the periphery of at least one of said faces, aligned openings in said disks, and threaded means in said openings for locking said disks together and maintaining said disks in locked relation



after repeated grinding of a body face, to renew the peripheral cutting edge.

4,510,690
DIPSTICK GUIDE DEVICE FOR AUTOMOTIVE VEHICLES
Anthony R. Attler, 74 Price St., Dobbs Ferry, N.Y. 10522
Filed Feb. 8, 1984, Ser. No. 577,983
Int. Cl.³ G01F *23/04*
U.S. Cl. 33—126.7 R **8 Claims**

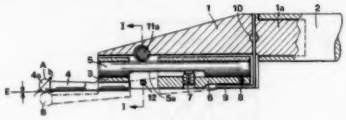


1. A dipstick guide device for automotive vehicles, comprising, a bottom sleeve for securing said device to a dipstick tube of an engine, a housing received on said sleeve, a split sleeve received in said housing, providing quick and smooth insertion of said dipstick into said dipstick tube, and a clamp received on said bottom sleeve, for retaining said guide device to said dipstick tube.

4,510,691
DEVICE FOR MEASURING DISTANCES BETWEEN TWO OPPOSITE SURFACES
Hans Meyer, Rue du Bugnon 24, 1020 Renens, Switzerland
Filed Oct. 3, 1983, Ser. No. 538,518
Claims priority, application Switzerland, Oct. 8, 1982, 5939/82
Int. Cl.³ G01B *5/02*
U.S. Cl. 33—169 R **6 Claims**

1. A measuring device, especially for measuring the distance between opposite surfaces, comprising a body in which a lever provided with a feeler head is pivotably supported, characterized in that the angular movement of said lever is limited by

stops positioned so that the body always takes the same position in each of two opposed measuring directions on alternate



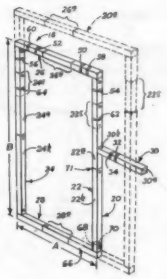
measuring of two surfaces facing in opposite directions and lying in the same plane.

4,510,692

COMBINED BATTERS' AND CATCHER'S BOX MARKING FRAME

Duane J. Overholser, 427 NE. Yamhill, and Craig M. Prough, 359 NE. Elm, both of Sheridan, Oreg. 97378

Filed Mar. 18, 1983, Ser. No. 476,823
Int. Cl.³ A63C *19/06*
U.S. Cl. 33—174 G **16 Claims**



1. A template usable for marking each of two batter's boxes and a catcher's box with reference to a home plate of a ball diamond, where such boxes have predetermined widths and lengths as set by regulations of a particular league and where each side of such catcher's box contacts an end of a batter's box, said template comprising

a rectangular frame having a pair of spaced-apart parallel sides and a pair of spaced-apart parallel ends, said frame sides and ends being structured with dimensions having a preselected relationship to those of a batter's box and a catcher's box,

means for positioning said frame in a regulation position relative to a home plate for marking a batter's box, and

indicia formed on said frame for referencing said frame relative to at least one first-marked batter's box for marking a catcher's box in a regulation position.

4,510,693

PROBE WITH STYLUS ADJUSTMENT

Robert F. Cusack, Grosse Pointe, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 388,187, Jun. 14, 1982, Pat. No. 4,451,987. This application Jun. 14, 1983, Ser. No. 504,149
Int. Cl.³ G01B *7/02*
U.S. Cl. 33—174 L **18 Claims**

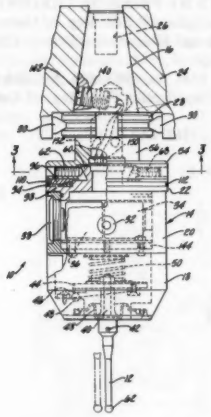
1. In a probe assembly including an adapter detachably connected to a probe housing having a stylus projecting from one end thereof for contacting an object, the improvement comprising:

means defining a well of a given radial dimension in an end face of the adapter;

the opposite end of the housing having a member projecting therefrom with a radial dimension less than that of the well and being insertable therein; and

radially adjustable means for contacting sides of said member and radially shifting said housing to position the stylus at a desired location relative to a major axis of the adapter.

16. In a probe assembly including an adapter detachably connected to a probe housing having a stylus projecting from one end thereof for contacting an object, the improvement comprising:



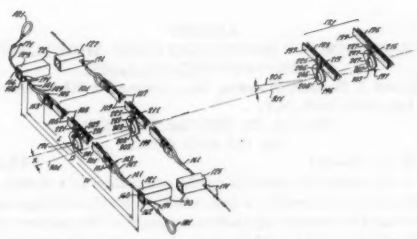
means for engaging mutually opposing end faces of the adapter and probe housing, operative to adjust the tilt of the probe housing to thereby position the longitudinal axis of the stylus at a desired orientation, said means including a pair of beveled washers having nonparallel surfaces mounted between the opposing end faces of the probe housing and adapter, said washers being adapted to be rotated with respect to each other to effect adjustment of the tilt of the stylus.

4,510,694

VEHICLE ALIGNMENT APPARATUS AND METHODS

William A. Boyce, Huntington Beach, Calif., assignor to Macaster Controls, Inc., Huntington Beach, Calif.

Continuation-in-part of Ser. No. 337,252, Jan. 1, 1982, Pat. No. 4,433,489. This application Dec. 27, 1983, Ser. No. 566,632
Int. Cl.³ G01B *5/255*
U.S. Cl. 33—203.18 **15 Claims**



1. Wheel alignment measuring apparatus comprising:

a pair of frames, each adapted for engaging a sidewall of a tire; and,

biasing means for engaging said frames with the tire sidewalls of coaxially mounted tires while the coaxially

mounted tires are supporting the vehicle on a road surface or the like,

said biasing means including a spring and an elastic member, said spring and elastic member being connected in parallel between the frames.

4,510,695

METHOD OF CALIBRATION FOR THE MEASURING OF OBJECTS BY PAIRS OF THEODOLITES

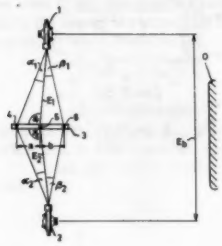
Helmut Leitz, Konigsbronn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Mar. 31, 1983, Ser. No. 480,810

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3215038

Int. Cl.³ G01C *15/02*

U.S. Cl. 33—293 **10 Claims**



4. Apparatus for determining the base length (E_b) between two angle-measuring instruments used for triangulation measurement of one or more points offset from the geometric alignment of the angle-measuring instruments, said apparatus comprising a calibrating device mounting at least three fixedly spaced and aligned optical targets in the form of balls on a single fixed axis of alignment, said targets being adapted to be sightable by each of the respective angle-measuring instruments when said calibrating device is fixedly positioned at a location generally intermediate the angle-measuring instruments, whereby said balls may be correctly sighted from each of the respective angle-measuring instruments, within a range of elevation differences between sighting and calibration locations, and regardless of whether the calibration device is above or below the elevation of either of the angle-measuring instruments.

4,510,696

SURVEYING OF BOREHOLES USING SHORTENED NON-MAGNETIC COLLARS

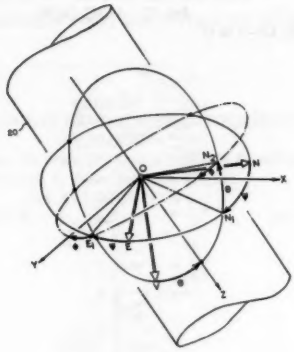
Richard F. Roesler, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Jul. 20, 1983, Ser. No. 515,716

Int. Cl.³ E21B *47/022*

U.S. Cl. 33—304 **4 Claims**

1. A system for determining the orientation of a downhole instrument positioned in a drill collar in a borehole comprising: a means for determining inclination angle of the instrument at a location thereof in said borehole; a means for determining the highside angle of said instrument at said location; a means for determining the true horizontal and vertical components of the earth's magnetic field at the location of the borehole; a means for determining components of the local magnetic field perpendicular to the direction of a primary axis of the instrument aligned with the borehole at said location, said drill collar being constructed of non-magnetic material, and having a minimum length, L, determined from the equation:



$$L = 2\left[\frac{(|Pu| + |PL|)2d}{4\pi\, Bn\, \delta\psi}\right]^{\frac{1}{3}}$$

where P_u is the magnetic pole created by the magnetic material above the sensor, P_L is the magnetic pole created by the magnetic material below the sensor, d is the displacement of the poles P_u and P_L from the axis of the instrument, B_n is the North component of the earth's magnetic field at the tinstrument, and $\delta\psi$ is the error in the azimuth angle.

4,510,697

MICROWAVE CLOTHES DRYER

Gary Beasley, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

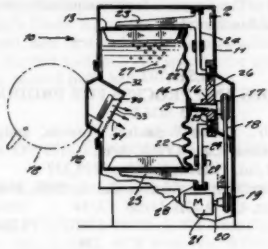
Filed Jan. 19, 1983, Ser. No. 459,366

Int. Cl.³ F26B *23/04*

U.S. Cl. 34—1 **3 Claims**

1. A microwave clothes dryer, comprising in combination,a nousing having a door on its front side, a flexible tumbler secured to a shaft inside said housing, said tumbler being formed of material allowing for shape change of said tumbler as it rotates and a microwave heater on an inner side of said door for radiating microwaves toward clothes inside said umbler, said shaft being rotatably driven by a motor, wherein

said tumbler includes a flexible rear wall and a flexible cylindrical side wall whereby said cylindrical side wall is attached to



transverse ribs integral with arms that transcribe an elliptical course, said shaft being secured to said rear wall.

4,510,698

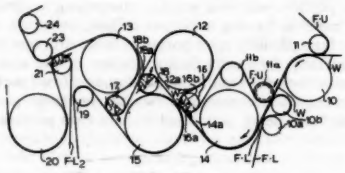
DRYER FELT RUN

Donald A. Ely, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 426,609, Sep. 29, 1982, Pat. No. 4,485,567. This application Dec. 7, 1982, Ser. No. 447,701

Int. Cl.³ F26B *13/08*

U.S. Cl. 34—117 **9 Claims**



1. A paper or board dryer for the removal of liquid from a traveling web comprising in combination:

a plurality of rotatably mounted upper dryer drums adapted to be heated to carry a web and evaporate moisture therefrom;

a plurality of rotatably mounted lower dryer drums adapted to be heated to carry the web and evaporate moisture therefrom;

said drums positioned to carry the web in a sinuous path passing successively between the upper and lower drums with the web wrapping the upper and lower surfaces of the drums respectively;

upper and lower looped felts formed of a pervious material accommodating the escape of water vapor from the web and wrapping the web on the upper and lower surfaces of the upper and lower drums respectively;

upper and lower felt rolls for the upper and lower felts respectively with one felt roll between each pair of adjacent drums for the upper drums and for the lower drums;

said lower felt rolls positioned to carry the portion of the upper felt between the adjacent lower drums into the spaces between the lower drums;

said upper felt rolls positioned to carry the portions of the lower felt between adjacent upper drums into the spaces between said upper drums;

said felt rolls being formed of perforate roll shells;

glands inside of said roll shells dividing the shells into a first portion exposed to the oncoming web and a second portion exposed to the offrunning web;

pressure means connected to one of said portions of said glands; and

vacuum means connected to the other of said portions of said glands so that the web is subjected to pressure and vacuum in its travel across the felt roll and the spaces between the drums and the felt rolls are subjected to pressure and vacuum;

said felt rolls and drums positioned so that the felt and web runs are arranged to eliminate any open unsupported web runs and the web is automatically transferred between top and bottom dryer felts without subjecting the web to an open unsupported web run.

4,510,699

INSOLE

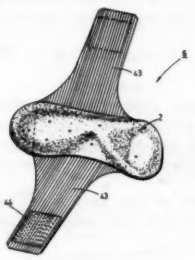
Toshiro Nakamura, 132, Omori-cho-ha, Oda-shi, Shimane 694-03, and Tetsuya Watanabe, Oda, both of Japan, assignors to Toshiro Nakamura, Oda, Japan

Filed Oct. 28, 1982, Ser. No. 437,300

Claims priority, application Japan, Oct. 26, 1981, 56-195741[U]; Oct. 29, 1981, 56-162981[U]; Mar. 30, 1982, 57-52709

Int. Cl.³ A43B *13/40, 13/38*

U.S. Cl. 36—43 **7 Claims**



1. An insole of wedge-shaped, irregular or curved section which insole comprises:

inorganic filler in the range of five to seventy-five parts;

hydrousilicate powder in the range of five to thirty parts;

heat vulcanized silicone rubber of substantially one hundred parts; and

silicone rubber vulcanizing agent of substantially ten parts.

4,510,700

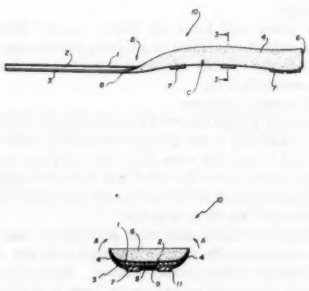
VARIABLY ADJUSTABLE SHOE INSERTS

Dennis N. Brown, 1091 Fir Ave., Blaine, Wash. 98230

Filed Sep. 30, 1982, Ser. No. 431,291

Int. Cl.³ A43B *13/38, 13/40*

U.S. Cl. 36—44 **7 Claims**



1. An orthotic appliance adapted to be placed as an insert

within or form a part of a boot, shoe, or the like comprising in combination:

an initial blank having an upper surface that generally follows the contour of the plantar surface of a foot,

a bottom surface of said blank having a zone of disparate resiliency relative to areas adjacent said zone,

cap means underlying said bottom surface,

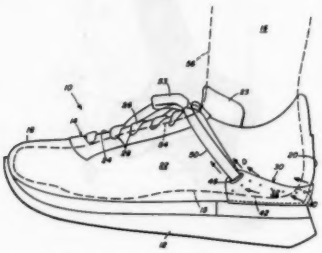
and means for interfitting said cap to said blank wherein said interfitting means comprises a peripheral wall extending up from said cap engaging side walls of said blank, said side walls including a stepped in shelf portion complemental to the thickness of said perpheral wall so that the outer side edges of said appliance is substantially smooth.

4,510,701

ATHLETIC SHOE AND COUNTER

Avi Schour, and Igal Bloch, both of Boca Raton, Fla., assignors to H. H. Brown Shoe Co., Inc., New York, N.Y.

Filed Jun. 15, 1983, Ser. No. 504,614
Int. Cl.³ A43B *13/41*
U.S. Cl. 36—68 **6 Claims**



1. In a laced athletic shoe comprising

a sole, and

a shoe upper connected to said sole and adapted to receive and confine a wearer's foot,

said upper having a toe portion, a heel portion and an intermediate connecting portion therebetween,

said intermediate connecting portion including a U-shaped opening extending rearwardly from proximate the toe portion secured by laces extending between lace-engaging eyelets along the periphery of said opening,

said heel portion including a counter having at least a rearward portion and forwardly extending side portions, and

said heel portion further including a pair of side eyelets affixed to the forwardly extending side portions of said counter for receiving the end portion of said laces therethrough,

whereby when said laces are drawn tightly through said eyelets, said intermediate connecting portion and said heel portion in the vicinity of said side eyelets are drawn close to the wearer's foot,

the improvement wherein

said counter is a rigid external counter of cup-form configuration, including a base portion extending from said rearward and forwardly extending side portions beneath the wearer's foot above the sole, and said heel portion side eyelets are defined in the forwardly extending surfaces of said external cup-form counter,

the height of each said side portion of said external counter above the sole in the region of the respective side eyelet being greater than the height of said side portion at a point more remote from said eyelet,

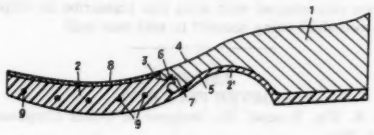
whereby when said laces are drawn tightly, said rigid cup-form counter is drawn against the immediate bottom rear portion of the wearer's foot and the rearward and upwardly extending side portions of said counter are drawn against the rear and side portions of the wearer's foot, all in the direction of the laced upper intermediate connecting portion of the shoe to snugly grip the shoe about opposed sides of the wearer's foot to eliminate movement of said foot within said shoe.

4,510,702

SOLE FOR SHOES AND PROCESS FOR PRODUCING SAID SOLE

Johann Ehrlich, Jr., Krems/Weinzierl, Austria, assignor to Patoflex Corporation, Cave Creek, Ariz.

Filed Jul. 1, 1981, Ser. No. 279,237
Claims priority, application Austria, Jul. 1, 1980, 3443/80
Int. Cl.³ A43B *13/08, 13/14*
U.S. Cl. 36—86 **25 Claims**



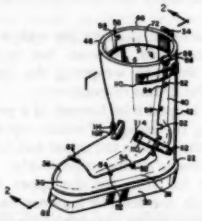
1. A sole for shoes and the like comprising a substantially rigid rear portion, a flexible front portion connected to said rear portion approximately at the area of the ball of the foot, and a protrusion which integrally extends from the bottom side of said front portion along at least a portion of the bottom side of said rear portion, said rear portion comprising a substantially rigid material having a porous cellular structure and having an at least partially open porous cellular structure in at least the generally forwardly facing portion of the area of interconnection thereof to said front portion, said front portion and said protrusion comprising a flexible synthetic plastic material, and both being connected to said rear portion by foaming.

4,510,703

SKI BOOT

Harrison Eiteljorg, 142 Grays La., Haverford, Pa. 19041

Filed Dec. 17, 1982, Ser. No. 450,764
Int. Cl.³ A43B *5/04*
U.S. Cl. 36—119 **10 Claims**



1. A boot for wear by a user while skiing, comprising:

a sole member for attachment to a ski binding;

a first half shell rigidly affixed to the sole member and forming a toe, sides and a back for the boot, said first half shell extending in use under and alongside the user's foot and lower leg;

a second half shell, mountable on the first half shell, and extending in use over and in front of the user's foot and lower leg, the first and second half shells being rigidly engageable along complementary mating edges thereof, the first and second half shells together enclosing the user's foot and lower leg when in use;

a first means including a belt attached to the sole member for tightly affixing the user's foot to the sole member at the instep; and,

a second means including a belt attached to the first half shell at a point above the sole member, for tightly affixing the user's lower leg at the shin to the first half shell at said point, said first and second means affixing the user's foot to the first half shell and spacing the user's lower leg from the second half shell.

4,510,704

BOOT OR SHOE INCORPORATING PEDOMETER OR THE LIKE

William N. Johnson, Barnet House, Totteridge, London N.20, England

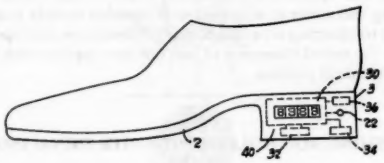
PCT No. PCT/GB82/00119, § 371 Date Dec. 2, 1982, § 102(e) Date Dec. 2, 1982, PCT Pub. No. WO82/03753, PCT Pub. Date Nov. 11, 1982

PCT Filed Apr. 23, 1982, Ser. No. 451,166

Claims priority, application United Kingdom, Apr. 25, 1981, 8112807; Sep. 28, 1981, 8129212; Apr. 7, 1982, 8210351

Int. Cl.³ A43B *3/00*; G01C *22/00*

U.S. Cl. 36—136 **8 Claims**



1. A boot or shoe incorporating an electronic transducer for detecting when a step is made with the foot wearing the boot or shoe by the wearer thereof, said transducer being arranged to provide an electrical signal for each step detected, the boot or shoe further incorporating electrical circuitry embodying electronic counting and processing means for counting such signals, and electrical or electronic display means operable by said counting and processing means to display numerical quantities derived thereby, said display means including a display element visible from the exterior of the shoe through a transparent window, and user-operable selection means operable to control the operation of said counting and processing means and the operation of the display means by the counting and processing means, said electrical circuitry further including electronic or electrical timing means connected with said counting and processing means, the counting and processing means being operable to record elapsed time as well as the number of signals received from said step detecting means, the counting and processing means being operable by said user-operable selection means to cause said display means to display optionally time or distance-related data.

4,510,705

WATER-BOTTOM RUBBLES LEVELING APPARATUS

Yoshitane Ishino, Odawara; Toshihisa Naruse, and Toshiyuki Sawano, both of Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 21, 1983, Ser. No. 563,731

Int. Cl.³ E02F *5/00*

U.S. Cl. 37—54 **7 Claims**

1. A water-bottom rubbles leveling apparatus, comprising:

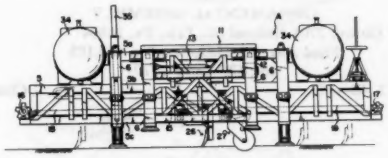
a main body frame having a plurality of telescopic legs mounted thereto;

a first movable frame mounted on said main body frame for movement in the longitudinal direction of said main body frame;

a second movable frame mounted on said first movable frame for movement in the lateral direction of said main body frame, said second movable frame having a plurality of telescopic legs mounted thereto;

means for effecting movement of said first movable frame relative to said main body frame;

means for effecting movement of said second movable frame relative to said first movable frame;



means for extending and retracting said telescopic legs of said main body frame and said second movable frame;

a carrier mounted to said main body frame for movement in the longitudinal direction of said main body frame;

means for effecting movement of said carrier; and

a rake mounted to said carrier projecting downwardly therefrom.

4,510,706

CUTTING-TOOTH ANCHOR FOR SUCTION DREDGE AND METHOD OF MAKING SAME

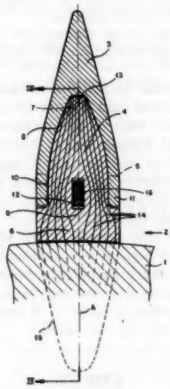
Rütger Berchem, Gelsenkirchen, Fed. Rep. of Germany, assignor to Berchem & Schaberg GmbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Jan. 6, 1984, Ser. No. 568,607

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1983, 3300467

Int. Cl.³ E02F *9/28*

U.S. Cl. 37—64 **6 Claims**



1. In a suction dredge provided with a suction head bearing a multiplicity of cutting-tooth anchors welded to the periphery thereof,

the improvement wherein each of said anchors comprises an elongate unitary body of ductile steel with a yield strength of at least 120 kp/mm², said body having a base welded onto said periphery, a crenellated rim adjacent said base with radially outwardly open indentations, and a nose rising from said base beyond said rim within the crenellations thereof, said nose tapering toward a tip remote from said base and having a throughgoing transverse slot opening onto two diametrically opposite indentations of said rim, said body having an oriented structure with grains

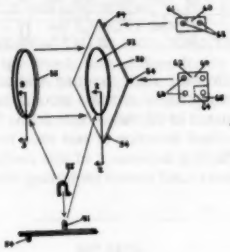
bending around said indentations and said slot, said base having a pair of radially inwardly extending prongs straddling a peripheral zone of said suction head, said grains extending along substantially continuous lines from the free ends of said prongs to said tip while also bending around said peripheral zone.

4,510,707

ORNAMENTAL ASSEMBLY

Leroy Girard, 2701 Holland St., Erie, Pa. 16504

Filed Aug. 16, 1982, Ser. No. 408,185
Int. Cl.³ G09F 1/12
U.S. Cl. 40—152 **7 Claims**



1. In combination, an ornamentation for a Christmas tree and means to support said ornamentation on a Christmas tree comprising, a plurality of square shaped picture frame units,

each said frame unit comprising: a generally circular raised rim disposed adjacent to the central part of a sheet on a first side thereof and defining a circular space and extending substantially entirely around said circular space,

a ring, U-shaped in cross section at each side of said ring,

said U-shaped cross section frictionally receiving said rim and releasably holding said rim in place,

a picture disposed within said rim,

said U-shaped ring being snapped on said rim, said ring overlying an edge of said picture, holding said picture in position,

means to connect said picture frame units together,

said means to connect said picture frame units comprising raised pins on the back of said picture frame units,

and assembly links having spaced holes for receiving said raised pins holding said frame units together providing an assembly of pictures in said frames for display on said tree, whereby a plurality of pictures can be supported on said tree as ornaments thereon,

one said assembly link being adapted to link together one said corner form each of two said units,

said assembly link being rectangular with at least two holes, each adapted to receive one said raised pin,

one said assembly link is adapted to link together one said corner of each of four said units.

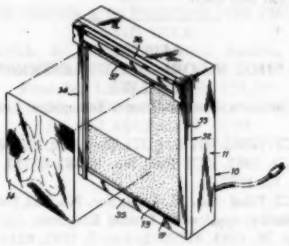
4,510,708

VIEWER FOR X-RAY AND LIKE FILMS

Jordan J. Pokrinchak, Shelton, Conn., assignor to Bar-Ray Products, Inc., Brooklyn, N.Y.

Filed Jul. 27, 1984, Ser. No. 635,170
Int. Cl.³ G02B 27/02
U.S. Cl. 40—361 **14 Claims**

1. In a viewing device for X-ray films or the like including a housing, a light source in said housing, a diffuser plate mounted on said housing and holder means for supporting a film to be viewed against said diffuser plate, the improvement comprising a masking assembly for blocking light from said source from passing through said plate except in the areas of said film, said assembly including an elongate scroll member interposed between said light source and said diffuser plate, said scroll member including a plurality of linearly spaced apart light transmitting areas sized to correspond to the standard dimensions of films to be viewed, the spaces between said light transmitting areas being opaque, motor means operatively connected to said scroll member for shifting said scroll member linearly thereof in either direction, sensor means positioned in the path of an edge portion of a film disposed in predetermined



position in said holder means for sensing the dimension of said edge portion, and control means triggered by said sensor means and operatively connected to said motor means for causing said motor to drive said scroll member linearly to align a light transmitting area of said scroll of dimension corresponding to the sensed dimension of said film into registry with said predetermined position.

4,510,709

FISHING ROD HOLDER WITH BITE SIGNALING MEANS

Alton R. Melcher, 40262 Santa Teresa Common, Fremont, Calif. 94539

Filed Sep. 15, 1983, Ser. No. 532,453
Int. Cl.³ A01K 97/12
U.S. Cl. 43—17 **12 Claims**

1. A fishing rod holder with bite signalling means comprising:

an elongated tubular housing having moisture sealing means in first and second ends thereof and at least one outer side surface;

a generally U-shaped fishing rod supporting yoke connected to the outer surface of an elongated resilient strap having an inner and outer surface, said yoke being connected at the first end of said strap, the second end of said strap being connected to the housing outer side surface at a location that extends said yoke adjacent and beyond the first end of said housing, said strap being substantially parallel with said housing side surface with the inner surface thereof facing said housing side surface;

an electrical switch mounted within said tubular housing

having switch closing means extending from said outer housing side surface, said closing means being located adjacent said housing first end and positioned to contact the inner surface of said strap;

electrical alarm means mounted within said tubular housing responsive to a closing of said electrical switch; and

sensitivity adjustment means including an adjustable screw extending from said outer housing side surface and located in one of a plurality of threaded holes through said housing between the first end thereof and the point of connection of said elongated resilient strap to said side surface, the end of said screw extending from said side surface being adjustable to contact the inner surface of said strap.

4,510,710

FISHING LURE

Thomas J. Hanna, 685 Johnson Rd., Jonesboro, Ga. 30236; Bill C. Logsdon, and Elmer E. Meredith, both of Radcliff, Ky., assignors to Thomas J. Hanna, Jonesboro, Ga.

Filed May 25, 1983, Ser. No. 497,968
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.13 **1 Claim**

1. A fishing lure comprising:

(a) a shank with barbed hook means at its rear end and eyelet means at its front end;

(b) a body with a skirt attached to the shank adjacent the hook means;

(c) a plurality of arms attached to the shank adjacent the eyelet means and having rear portions extending generally toward the body from the eyelet means;

(d) propeller means rotatably mounted on the arms' rear portions and wherein the arms' rear portions are spaced apart and the propellers are dimensioned so that when the propellers turn in response to movement of the lure in the water, the propellers strike each other only as a result of their rotation and provide lift to the lure; and

(e) flotation devices mounted on the arms' rear portions rearward of the propellers.

4,510,711

DECORATIVE FLY-SWATTING DEVICE

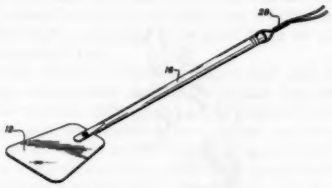
David C. Bucek, 324 Lazy La., Wharton, Tex. 77488

Filed May 5, 1983, Ser. No. 491,906
Int. Cl.³ A01M *3/02*
U.S. Cl. 43—137 **4 Claims**

1. A combination tool having the external configuration of a flyswatter when in its assembled condition, comprising:

(a) a generally planar blade having an approximately rectangular shape and being generally devoid of perforations but having an aperture near one edge thereof for receiving a fastener, and the blade being formed of a leathery material having sufficient stiffness as to be essentially self-supporting, and the blade being decorated and being treated with a water-repellant compound so as to render it impervious to moisture and to preserve the decoration, whereby the blade may be repeatedly rinsed with water for cleaning purposes;

(b) a rigid handle having a length about three times as long as the length of the blade, and the first end of said handle having a longitudinal slot of sufficient thickness to snugly receive the blade within said slot, and the orientation of the slot being generally parallel to the longitudinal axis of the handle so as to create two cantilevered end portions that lie respectively above and below the slot, and there



being a transverse bore through the two cantilevered end portions at a location to coincide with the blade aperture when the blade is inserted fully into the slot; and

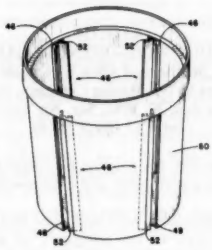
(c) a mechanical fastener for insertion into the transverse bore so as to removably attach the blade to the elongated handle by passing through the juxtaposed openings that are defined by the bore and the blade aperture.

4,510,712

AIR-ROOT-PRUNING CONTAINER

Carl E. Whitcomb, Stillwater, Okla., assignor to Board of Regents for the Oklahoma Agriculture and Mechanical Colleges Acting for and in Behalf of Oklahoma State University, Stillwater, Okla.

Continuation-in-part of Ser. No. 309,085, Nov. 9, 1981,. This application May 17, 1982, Ser. No. 379,149
Int. Cl.³ A01G *9/02*
U.S. Cl. 47—66 **9 Claims**



1. A container adapted to contain a growing medium and a plant comprising:

(a) a bottom wall;

(b) a circumferentially upwardly extending sidewall attached to the perimeter of said bottom wall thus forming an open-topped container; and

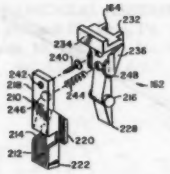
(c) one or more vertical air-root-pruning means displaced in said sidewall forming an off-set air gap to air-prune roots of said plant thus inhibiting the tendency of said roots to grow in a spiral and stimulating additional root branching and wherein at least one of said air-root-pruning means is bidirectional.

4,510,713

WINDOW STRUCTURE

Richard N. Anderson, Owensboro, Ky., assignor to V. E. Anderson Mfg. Co., Owensboro, Ky.

Division of Ser. No. 50,818, Jun. 21, 1979, Pat. No. 4,398,372.
This application Aug. 16, 1983, Ser. No. 523,677
Int. Cl.³ E05D *15/22*
U.S. Cl. 49—175 **8 Claims**



1. Tilt release and upper sash guide structure for use with a tiltable window sash having two ends and a tilting and a pivoted edge guided in movement between frame jamb members including a sash guide member having a hollow generally rectangular lower end including an open front and back and a generally flat rectangular upper end at the back thereof having a notch extending into the generally rectangular lower end from the back thereof which sash guide member is adapted to be secured to the sash adjacent the tilting edge of the sash at one end thereof and a tilt release member having pivot bosses extending from one end thereof on both sides of the tilt release member positioned within the notches in the sash guide member to mount the tilt release member on the sash guide member for pivotal movement about the one end of the tilt release member, guide fins on the tilt release member at the other end thereof extending away from the sash guide member engageable with a frame jamb member for guiding the sash in movement in the plane of the frame, resilient means positioned between the sash guide member and tilt release member for urging the other end of the tilt release member away from the sash guide member and into engagement with the frame jamb and an operating tab on the other end of the tilt release member for facilitating grasping and pivoting of the other end of the tilt release member toward the sash guide member to remove the guide fins from contact with the frame and permit pivoting of the window sash about the pivoted edge thereof.

4,510,714

POWERED OUTWARD-OPENING CARGO DOOR

James R. Kasper, Seattle, and Allan W. Opsahl, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1982, Ser. No. 431,193
Int. Cl.³ E05D *15/40*
U.S. Cl. 49—249 **8 Claims**

1. A door assembly for closing an opening in a wall, said opening including a periphery, said door assembly comprising:

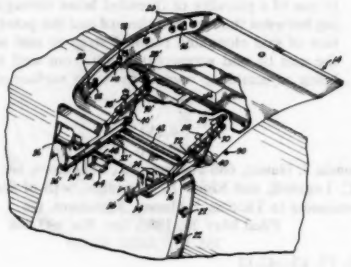
a door;

hinge means associated with said door and said opening to mount said door to the periphery of said opening for swinging movement of said door between a first position in which said door is within said opening, and a second position in which said door is spaced from said opening and positioned above said opening in a canopy orientation;

hinge drive means drivingly coupled to said hinge means for driving said door between said first and second positions;

power means drivingly coupled to said hinge drive means for providing power to said hinge drive means, said hinge drive means being constructed and arranged such that said hinge drive means drives said hinge means only under power, said hinge means being immovable by manual operation while coupled to said hinge drive means;

latch means associated with said door and manually operable when said door is in said first position, to move said door upwardly a predetermined distance prior to initiation of movement of said door toward said second position by said hinge drive means, said latch means including a handle means movable between a latched position and an unlatched position, movement of said handle means between said latched and unlatched position causing movement of said door upwardly within said opening; and,



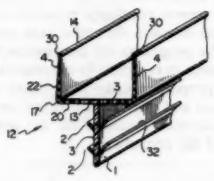
latch lock-out means associated with said handle means and operable when said door is spaced from said opening to prevent movement of said handle means from said unlatched position to said latched position, and constructed and arranged such that when said door is within said opening, said latch lock-out means is inoperative, thereby permitting movement of said handle means from said unlatched position to said latched position.

4,510,715

COMPOSITE WEATHER STRIP FOR WINDOWS AND DOORS

Jean P. Giguère, St-Agapit, Canada, assignor to Donat Flamand Inc., Lotbiniere, Canada

Filed Mar. 30, 1983, Ser. No. 480,307
Claims priority, application Canada, Nov. 12, 1982, 415437; Jan. 12, 1983, 419291
Int. Cl.³ E06B *7/16*
U.S. Cl. 49—488 **9 Claims**



1. Weather strip for use on the periphery of the hinged panel of a window or door opening being of constant cross-section and comprising a T-shaped base made of relatively rigid plastic material, said T-shaped base having a horizontal bar and a depending vertical gripping leg, said horizontal bar carrying along each edge thereof and functionally integral therewith a generally vertical wing which extends outwardly, laterally from the base and then curves upwardly away from said base, in a direction opposite from said gripping leg, said two wings being generally parallel to each other and spaced by a distance of the order of $\frac{1}{8}$ of an inch, said wings being made of a rubber-like plastic material which is more supple and flexible than the material of said T-shaped base, whereby said wings may bend easily when said hinged panel closes or opens and yet when said panel is in its fully closed position said wings confine a volume of air which constitutes an efficient barrier between inside and outside conditions, said wings being sufficiently supple as to regain their initial shape upon opening of said

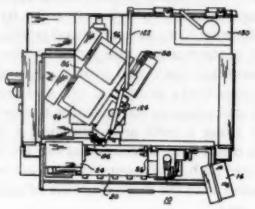
hinged panel and having sufficient resistance to cracking and tearing in spite of frequent panel opening and closing operations, said gripping leg having gripping means for holding said weather strip to the periphery of said panel by means of a continuous groove in the peripheral edges of said hinged panel.

4,510,716

GRINDING MACHINE HAVING IMPROVED DRESSING MEANS

Martin A. German, Holden, Mass., and Joseph F. Volk, Chagrin Falls, Ohio, assignors to The Warner & Swasey Co., Cleveland, Ohio

Division of Ser. No. 228,424, Jan. 26, 1981, Pat. No. 4,443,975.
This application Jun. 20, 1983, Ser. No. 506,076
Int. Cl.³ B24B *5/12*
U.S. Cl. 51—5 D **8 Claims**



1. A grinding machine for grinding a workpiece comprising:
a base;
workpiece support means for supporting a workpiece to be ground from said base;
an indexible plate;
a first driven grinding wheel disposed on said plate;
a second driven grinding wheel, spaced apart from said first driven grinding wheel, disposed on said plate;
indexible plate support means for supporting said indexible plate for movement to a first position where said first driven grinding wheel can engage the workpiece and said second driven grinding wheel cannot and to a second position where said second driven grinding wheel can engage the workpiece and said first driven grinding wheel cannot;
a carriage supporting said indexible plate and being movable with respect to said base to move the properly positioned one of said first or second driven grinding wheels into engagement with the workpiece; and
one of said first driven grinding wheel and said second driven grinding wheel is a straight feed grinding wheel and the other is an angled feed grinding wheel and further including drive means for moving said carriage along an x-axis and a z-axis;
at least a first dressing diamond supported from said base;
a programmable controller controlling said drive means for programmed movement of said carriage to dress a desired shape into said first and second driven grinding wheels.

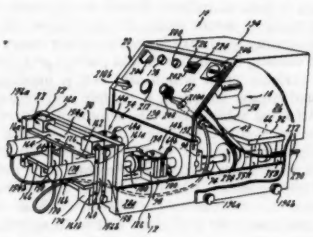
4,510,717

LENS FINISHING APPARATUS

Dewayne J. Sherwin, Imlay City, Mich., assignor to Coburn Optical Industries, Inc., Muskogee, Okla.

Filed Dec. 16, 1982, Ser. No. 450,502
Int. Cl.³ B24B *7/00*
U.S. Cl. 51—58 **22 Claims**

1. An apparatus for finishing a surface of a lens with a finishing tool, said apparatus comprising:
a main frame;
a non-rotatable shaft mounted to said main frame, said non-rotatable shaft having a central longitudinal axis, a first end, a second end and an intermediate portion between said first end and said second end;
universal mounting means mechanically interposed said intermediate portion of said non-rotatable shaft and said main frame, said universal mounting means fixing said intermediate portion of said non-rotatable shaft relative to said main frame and pivotally interconnecting said non-rotatable shaft with said main frame, said universal mounting means having a pivot point about which said non-rotatable shaft pivots, said pivot point lying on said central longitudinal axis;
eccentric drive means interconnected with said first end of said non-rotatable shaft to drive said first end of said non-rotatable shaft around a first predetermined circular path, said first predetermined circular path having a center of curvature axially aligned with said pivot point of said universal mounting means such that as said first end of said non-rotatable shaft moves about said first circular predetermined path and said non-rotatable shaft pivots about said pivot point, said second end of said non-rotatable shaft moves in a second predetermined circular path, said motion of said non-rotatable shaft having an orbital axis extending through said pivot point of said universal mounting means, said second predetermined circular path having a center of curvature axially aligned with said pivot point of said universal mounting means;
first means for mounting said finishing tool to said second end of said non-rotatable shaft;
first carrier means spaced a predetermined distance from



said second end of said non-rotatable shaft and slidably mounted to said main frame such as to be reciprocable along a predetermined path perpendicular to said orbital axis of said non-rotatable shaft, said perpendicular path of reciprocation further being in a common plane with said orbital axis of said non-rotatable shaft, said pivot point of said universal mounting means, and said centers of curvature of said first and second predetermined circular path;
second carrier means reciprocably interconnected with said first carrier means such as to be reciprocable relative to said first carrier means along a reciprocation axis parallel to said orbital axis of said non-rotatable shaft and having a portion near said second end of said non-rotatable shaft;
reciprocal drive means mechanically interposed said first carrier means and said main frame selectively operable to reciprocate said first carrier means relative to said second predetermined circular path relative to said main frame;
second means for mounting said lens to said portion of said second carrier means near said second end of said non-rotatable shaft, said second mounting means pivotally interconnecting said lens with said second end of said non-rotatable shaft; and
biasing means interposed said first carrier means and said second carrier means, said biasing means biasing said second carrier means toward said non-rotatable shaft and, thereby, biasing said second means for mounting towards said first means for mounting; said lens being removably interconnected to one of said mounting means and said finishing tool being removably interconnected to the

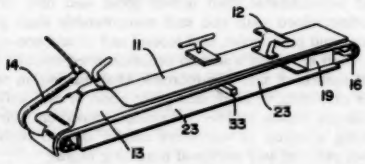
other end of said tool mounting means, whereby a combination of movements between said lens and said finishing tool is the sum of the orbiting of said non-rotatable shaft about said pivot point of said universal mounting means, and the reciprocable movement of said first carrier means along said predetermined path perpendicular to said orbital axis.

4,510,718

HULL SANDING DEVICE

Carl Eichenlaub, San Diego, Calif., assignor to Irving Loube, Oakland, Calif., a part interest

Filed Feb. 15, 1983, Ser. No. 466,438
Int. Cl.³ B24B *23/06*
U.S. Cl. 51—170 EB **6 Claims**



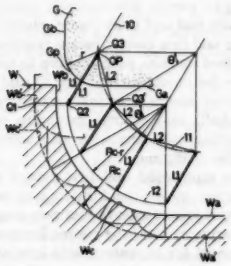
1. A device for sanding curved workpieces, comprising an elongated, longitudinally extending support member, pulley means for supporting an endless sanding belt, said pulley means including a pair of pulleys joined to opposed ends of said support member, motor means for driving one of said pulleys and said sanding belt, flexible pressure plate means for supporting said sanding belt between said pulleys and conforming to curved surfaces upon which said belt is impinged, said last mentioned means including a flexible and resilient pressure plate extending substantially the length of said support member, bracket means extending from opposed end portions of said support member for supporting said pressure plate, said pressure plate being sufficiently flexible to be deformable by manual impingement of said belt on the curved surface of the workpiece to conform to the curved surface, and pressure adjustment means for resiliently and yieldingly biasing a medial portion of said pressure plate with respect to said support member.

4,510,719

METHOD OF GRINDING A CURVED CORNER PORTION

Takso Yoneda, Toyoake, and Yasuji Sakakibara, Hekinan, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 8, 1982, Ser. No. 396,332
Claims priority, application Japan, Aug. 28, 1981, 56-135834
Int. Cl.³ B24B *1/00*
U.S. Cl. 51—289 R **8 Claims**



1. A method of grinding a curved corner portion of a workpiece by a grinding wheel having a curved edge surface whose curvature radius is smaller than that of said curved corner portion, said method comprising the steps of:

rotating said workpiece about a first axis, said workpiece being movable relative to said grinding wheel along a first path parallel to said first axis;

rotating said grinding wheel which is movable relative to said workpiece along a second path extending at an acute angle to said first path;

effecting relative movement between said rotating workpiece and said rotating grinding wheel along said first and second paths so as to position said rotating grinding wheel at a first grinding start position;

moving said grinding wheel inwardly by a predetermined distance from said grinding start position to an advanced position along said second path so as to permit said curved edge surface of said grinding wheel to grind a part of said curved corner portion of said workpiece;

moving said grinding wheel outwardly by said predetermined distance from said advanced position to said grinding start position along said second path;

moving simultaneously said workpiece and said grinding wheel respectively along said first and second paths so as to move said grinding start position to a next grinding start position along a path approximating a first curved arc which is offset from a second curved arc in a direction of said second path, said second curved arc being in concentric relation with the desired profile of said curved corner portion; and

repeating the steps of moving said grinding wheel inwardly, of moving said grinding wheel outwardly, and of moving said grinding start position to a subsequent next grinding start position;

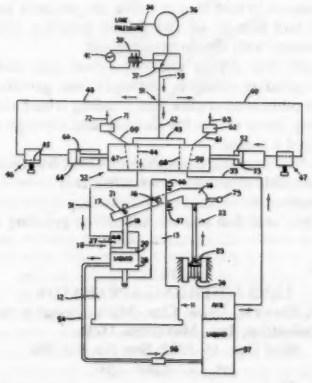
said first curved arc being so defined that said grinding wheel is prevented from engaging said workpiece when moved from one of said grinding start positions to a next grinding start position along said first curved arc.

4,510,720

HONING CONTROL SYSTEM

Russell C. Westberg, 5100 W. 106th St., Bloomington, Minn. 55435

Filed Mar. 28, 1983, Ser. No. 479,554
Int. Cl.³ B24B *33/02*
U.S. Cl. 51—34 J **4 Claims**



1. A honing machine system comprising a base assembly, a power unit pivotally mounted on said base assembly and having a first and second end, a honing tool assembly connected to a first end of said power unit for vertical reciprocal movement, a cylinder means mounted on said base assembly, a piston in

said cylinder connected at a second end to said power unit for reciprocally moving a first end and honing tool in a vertical direction, said piston separating said cylinder means into an air chamber and a liquid chamber, an air and liquid reservoir, means for interconnecting the liquid sides of said reservoir with the liquid chamber of said cylinder means, a reciprocating control valve, a first control valve actuator for moving said control valve in a first direction, a second control valve actuator for moving said control valve in a second direction, air source means for supplying air pressure to said control valve and said first and second actuators, said control valve interconnecting said air source means and said air chamber and said reservoir, said control valve having first and second air exhaust ports, a lower limit valve mounted on said base assembly operated by contact with said power unit and interconnecting said first actuator and said air source means, and an upper limit valve mounted on said base assembly operated by contact with said power unit and interconnecting said second actuator and said air source means, said power unit engages said upper and lower limit valves to operate said first and second actuators to reciprocate said control valve and direct air pressure into and out of said air chamber and reservoir and exhaust the air through said first and second air exhaust ports against the dampening action of liquid flowing between the liquid side of reservoir and said liquid chamber.

4,510,721

FENCE DROPPER

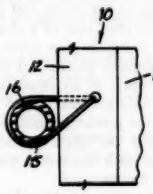
Michael F. Murphy, 12 Bond St., Norwood, State of South Australia, Australia

Filed Feb. 18, 1983, Ser. No. 467,929

Claims priority, application Australia, Feb. 19, 1982, PF2785

Int. Cl.³ E04H *12/00*

U.S. Cl. 52—40 **6 Claims**



1. A fence droper having been formed from a strip of sheet metal to have a pair of webs in a "V" formation, terminating in respective flanges which are substantially parallel to each other,

at least one pair of aligned apertures in said parallel flanges;

at least one wire retaining loop of such shape as to support a conduit, and having inturned ends engaging said pair of aligned apertures, said wire loop comprises a pair of legs and a bridge portion defining a general "U" shaped in plan and a tear drop shape in side elevation, one of said legs bearing against a flange edge when the loop supports a conduit, the shape and size of the wire loop being such that the wire loop thereby holds the conduit clear of the flange edges, and

notch defining surfaces also in said parallel flanges defining at least one pair of notches extending into the flanges and of such shape as to retain a fence wire.

4,510,722

DEVICE ADAPTED TO MOUNT A METAL JAMB OR FRAME, MORE PARTICULARLY A DOOR JAMB, INTO A WALL OPENING

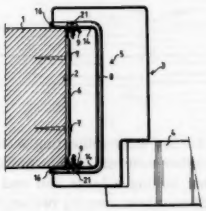
Gijsbertus L. van Wieringen, Amersfoort, Netherlands, assignor to N.V. Nederlandse Metaalindustrie Polynorm, Netherlands

Filed Feb. 28, 1983, Ser. No. 470,099

Claims priority, application Netherlands, Mar. 3, 1982, 8200848

Int. Cl.³ E06B *1/04*

U.S. Cl. 52—213 **4 Claims**



1. A device adapted to mount a metal frame or jamb, more particularly a door jamb, into a wall opening, said door jamb having a substantially U-shaped cross-section and comprising:

a fixing plate to be mounted on the reveal of a wall opening and formed by an oblong strip-shaped plate, extending over almost the entire width of said reveal; each end of the fixing plate comprising relatively short side flanges projecting from the wall; each side flange being provided with a bore hole;

an adjustable bracket;

means for connecting said adjustable bracket to said fixing plate in a slidable and fixable relation;

the bracket having a U-shape and two legs embracing the wall in the mounted position; said legs being provided with slot-shape openings for adjustably mounting the bracket to the side flanges of the fixing plate, said legs further being provided with receiving members for the receipt of a frame to be mounted.

4,510,723

PRESTRESSED CABLE ANCHORAGE SYSTEM

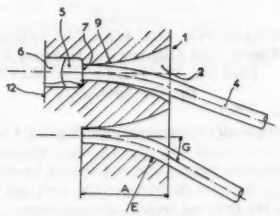
Rene P. Soum, 33 rue Montcabrier, 31500 Toulouse, France

Continuation of Ser. No. 369,792, Apr. 19, 1982, abandoned. This application Jun. 8, 1984, Ser. No. 618,327

Claims priority, application France, Apr. 24, 1981, 81 08616; Mar. 22, 1982, 82 05138

Int. Cl.³ F04C *3/10*

U.S. Cl. 52—223 R **8 Claims**



1. An anchorage block and a prestressed cable, said block comprising at least one orifice bore extending from an anchoring point at which said cable is anchored to said block to an outlet of the block through which said cable extends when it is attached to said block, said orifice bore having a generally

increasing cross section beginning at said point and extending to the outlet of the block for supporting the prestressed cable, said orifice bore being curved and having a generatrix in the form of the arc of a circle.

4,510,724
BUILDING STRUCTURE
Karl Magnuson, Rte. 1, Ewen, Mich. 49925
Filed Oct. 13, 1981, Ser. No. 310,890
Int. Cl.³ E04B *1/10*
U.S. Cl. 52—233 **4 Claims**

1. A building having interconnecting walls of horizontally stacked tapered timber members of substantially uniform thickness, each member having a large end and a small end, the large ends of such members varying ordinarily in height from one member to another and the small ends varying likewise in height from one member to another, each member having a tongue notched in each of its ends for corner joinder in a staggered relationship with like-formed members of adjoining walls, comprising:

a. said members being of the same degree of taper;

b. each member being tapered on one side throughout its length in relation to a substantially horizontal opposing side;

c. said members being arranged for uniform stacking in pairs of a fixed height, tapered side facing tapered side, large end on top of small end and small end on top of large end, producing two-member assemblages wherein top and bottom sides are parallel and substantially horizontal, said facing tapered sides of members being likewise parallel with facing tapered sides of other assemblages in the wall;

d. said members of assemblages having a tongue notched in each end for joinder in a staggered relationship with like-formed assemblages of adjoining walls;

e. said tongues being notched in the small ends of said members at a fixed vertical distance from the plane of the horizontal sides of said members;

f. said tongues being notched in the large ends of said members at a fixed vertical distance from the plane of the horizontal sides of said members;

g. said notches and tongues of stacked assemblages in one building wall being joined to fit the like-formed and equally placed tongues and notches of stacked assemblages of the same fixed height in adjoining walls.

4,510,725
BUILDING BLOCK AND CONSTRUCTION SYSTEM
Mark E. Wilson, 2314 Kingston Dr., Houston, Tex. 77019
Filed Sep. 17, 1981, Ser. No. 303,179
Int. Cl.³ E04C *1/10*
U.S. Cl. 52—309.1 **9 Claims**

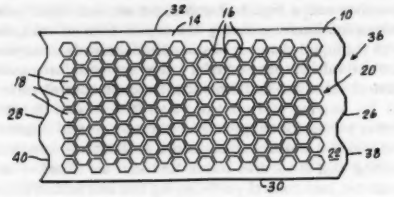
1. A substantially rectangular building block formed from a composition of wood fiber and a resin, comprising:

(a) a solid shell having first and second bearing faces;

(b) a web disposed centrally of the shell and extending between the first and second bearing faces;

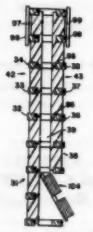
(c) a plurality of elongated openings defined by the web, the openings each having a substantially hexagonal cross-section and having their longitudinal axes arranged in parallel and terminating at the first and second bearing faces;

(d) said shell having first and second engaging faces adapted to mate with second and first engaging faces, respectively, of horizontally adjacent building blocks in an array of blocks; and



(e) said first and second engaging faces having solid keys extending therefrom.

4,510,726
INSULATED BUILDING STRUCTURE AND METHOD FOR ASSEMBLING SAME
Milton H. MacDonald, Jr., 5 Holly St., Woodsville, N.H. 03785
Filed Jun. 9, 1983, Ser. No. 502,760
Int. Cl.³ E04B *2/32*
U.S. Cl. 52—309.8 **13 Claims**



1. A wall insulation unit comprising:

a pair of laterally spaced, identical, elongated, blocks of plastic cellular foam insulation material, one block in mirror relationship to the other but spaced apart therefrom by at least the thickness of a block;

each block having one side face with a central, vertical recess of predetermined width and depth and a pair of vertical recesses, each at an opposite end thereof and equal in depth to said predetermined depth and equal in width to one half the predetermined width of said central recess for receiving the major portion of the depth of vertical wall studs with the minor portions thereof protruding from said recesses and

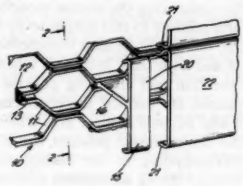
each block having a top face a bottom face and two opposite end faces, each with a tongue and groove configuration thereon adapted to mate and interengage with corresponding tongue and groove configurations of juxtaposed blocks to seal the joints therebetween;

4,510,727
GRID SUPPORTED STRUCTURE
Harold R. Jury, Glynde, Australia, assignor to Ampliform Pty. Ltd., Royal Park, Australia
Filed Jul. 1, 1982, Ser. No. 394,280
Claims priority, application Australia, Jul. 8, 1981, PE9646
The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.
Int. Cl.³ E04B *1/38*
U.S. Cl. 52—508 **7 Claims**

1. Grid supported structure comprising:

an expanded metal grid having a plurality of beads which are non-rectilinear and are interconnected by rows of webs,

the webs of any one row being staggered with respect to the webs of the next adjacent row, the said beads comprising narrow-mouth grooves, each groove comprising side faces which slope with respect to one another forming re-entrant faces running from the mouth of each groove;



a plurality of panel support brackets having a relatively narrow portion entering the mouth of said groove and a head engaging and retained by said re-entrant faces, and panels carried by said support brackets.

4,510,728

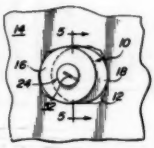
WALL-PATCH ADAPTER

Clyde Key, 11426 Coriender Ave., Fountain Valley, Calif. 92708

Filed Jul. 8, 1983, Ser. No. 511,871

Int. Cl.³ E04G *23/02*

U.S. Cl. 52—514 **1 Claim**



1. A wall-patch-plug device adapted to aid in the patching of a hole in a damaged gypsum-type wallboard, the device comprising:

a pair of juxtaposed plate members adapted to be laterally adjustable relative to each other, so as to be secured within said hole in said wallboard to allow patch material to be supported therein;

wherein said pair of plate members includes:

a first plate member having a central bore disposed therein; and

a second plate member having an eccentrically disposed hole therein;

said plates being superposed on each other and adapted to be laterally moved relative to each other; and

means engaging said plates for adjusting and securing said plates within said hole of said wallboard;

wherein said adjusting-and-securing means comprises:

a keeper means which is formed having an enlarged, annular, head member;

a reduced-diameter boss adapted to be rotatably received in said central bore of said first plate member;

a projecting, eccentrically positioned, pin member adapted to be received in said eccentrically positioned hole of said second plate member; and

a central keyway formed in said keeper means, whereby said keeper means is rotated, thereby causing said first and second plate members to move laterally with respect to each other, so as to lockingly engage said patch plug within said hole in said wallboard.

4,510,729

METHOD AND TEMPLATE FOR APPLYING RELIEF PLASTERING ON A WALL SURFACE

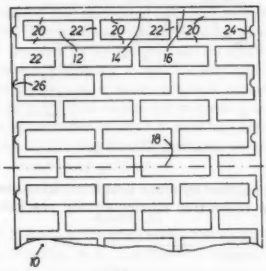
Ewald Syring, Brinker Weg 4a, D-5620 Velbert-Langenberg, Fed. Rep. of Germany

Filed Apr. 7, 1983, Ser. No. 483,075

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234481; Oct. 27, 1982, 3239761

Int. Cl.³ E04F *21/04*

U.S. Cl. 52—741 **17 Claims**



1. Method for applying relief plastering with joints on a surface, wherein

(a) a network of lands made of a moisture-resistant material and corresponding to the structure of the joints is applied to the surface by means of a removable adhesive layer, the lands, when applied, defining a series of apertures spaced by the lands,

(b) subsequently, mineral plaster is applied to the surface which is provided with the network, and

(c) next, the network is pulled off the surface so that in the areas of the apertures projecting surface portions, and in the areas of the lands receding, joint-like surface portions are obtained,

characterized in that,

(d) the network of lands is formed into a continuous template which adheres by means of an adhesive layer to a width of continuous, removable carrier film that also covers the apertures,

(e) to apply the template to the surface, the carrier film is removed at one end from the template and this end is applied to the surface,

(f) the carrier film is then further removed to the same extent as the template is pressed onto the surface.

4,510,730

APPARATUS FOR SEAL-TESTING SACHETS, PACKETS AND THE LIKE

Alan S. Edmondson, Hinckley, England, assignor to Hulbritt Developments Limited, Leicestershire, England

Filed Feb. 16, 1982, Ser. No. 348,756

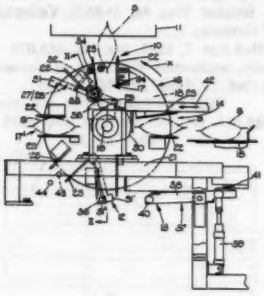
Claims priority, application United Kingdom, Dec. 18, 1981, 8138256

Int. Cl.³ B07C *1/10*

U.S. Cl. 53—53 **10 Claims**

1. Apparatus for seal-testing packages, comprising a receiving station at which said packages are received for testing, a delivery station at which the tested packages are delivered from the apparatus, at least one carrier device operative to receive said packages at the receiving station and carry same to the delivery station, the or each carrier device including a pair of opposed pressure members between which a package is received in use, moving means operative during movement of the or each carrier device between the receiving and delivery stations to effect relative movement between said pair of opposed pressure members such that said package is compressed

therebetween, and detection means operative to produce an output signal in the event that said pair of members are moved



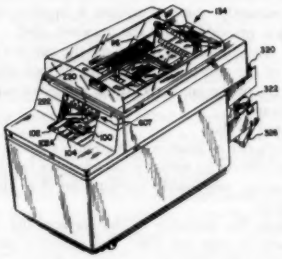
towards one another by more than a predetermined amount by the time the respective carrier device reaches the delivery station.

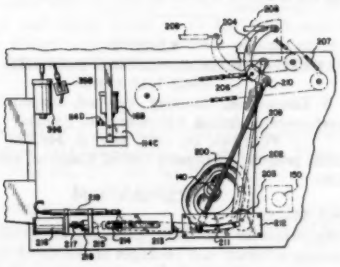
4,510,731

FILM WRAPPING MACHINE INCLUDING FILM LENGTH SELECTION

Raymond J. Mathieu, Ludlow Falls, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Apr. 26, 1982, Ser. No. 371,892
Int. Cl.³ B65B *59/02*
U.S. Cl. 53—66 **12 Claims**





1. In a film wrapping machine including a source of continuous film, an adjustable mechanism for controlling the reciprocating stroke of a film gripper between a fixed film end engaging position and a variable film extension position to thereby selectively pull appropriate lengths of film from the film source for wrapping a variety of package sizes, said adjustable mechanism comprising:

an output lever arm having first and second ends and being pivotally mounted at said first end to said wrapping machine;

an adjustable lever arm pivotally mounted to said output lever arm at said second end of said output lever arm and being coupled to the film gripper; and

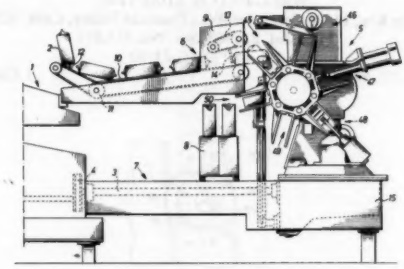
stroke adjustment control means coupled to said adjustable lever arm for controlling the pivotal motion of said adjustable lever arm relative to said output lever arm so that the same angular relation is defined therebetween for all adjustments of said adjustable lever arm when the gripper is moved to the film end engaging position and different angular relations are defined therebetween for each adjustment of said adjustable lever arm when the gripper is moved to the film extension position, the differing angular relations corresponding to the desired stroke and film length set by said stroke adjustment control means.

4,510,732

MACHINE FOR THE PROCESSING OF PACKING CONTAINERS

Stig A. Löthman, Veberöd, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Mar. 22, 1982, Ser. No. 360,562
Int. Cl.³ B65B *7/20*
U.S. Cl. 53—168 **33 Claims**



1. A machine for processing packing containers having corner lugs extending from the bottom and top of said containers, said machine comprising:

a first processing station for prefolding the corner lugs on each packing container, comprising a bottom corner lug folding plate for engaging the bottom of the containers and a pair of top corner lug folding plates, a supporting arm for supporting the plates;

a second processing station including nozzle means for applying adhesive means to the corner lugs for adhering the corner lugs to the container;

a third processing station for finally folding the corner lugs, comprising two co-operating lateral pressure plates and a bottom pressure plate, the three pressure plates being synchronously movable between a working and a non-working position; and

a container transport device which transports the packing containers between the processing stations, including:

a selectively rotating drum which rotates in incremental steps,

a plurality of holding means operably attached to the outer periphery of the drum and spaced around the periphery of the drum for holding said containers, wherein the processing stations are spaced around the periphery of the drum and wherein the spacing of the processing station coincides with the spacing of the holding means whereby the holding means are indexable from one processing station to the next;

radially outer guide rails extending along the path of said holder means, said radially outer guide rails being posi-

tioned on opposite sides of said holding means at said first station; and

radially inner guide rails extending along the path of travel of said holder means, said radially inner guide rails being positioned on opposite sides of said holding means at said first station;

drive means for radially moving said supporting arm to synchronously move the corner lug folding plates radially between a working position and a non-working position so that the motion of said bottom corner lug folding plate pushes a respective packing container into the holder element between said inner and outer guide rails so as to urge the bottom lugs against the radially outer guide rails and the top lugs against the radially inner guide rails to thereby radially outwardly prefold the bottom and top corner lugs.

4,510,733

METHOD AND AN APPARATUS FOR CLOSING PACKING BAGS FOR SLAUGHTERED POULTRY

Erik Hansen, Hörning, and Heinrich W. Lambach, Horsens, both of Denmark, assignors to Brdr. Schur International A/S, Horsens, Denmark

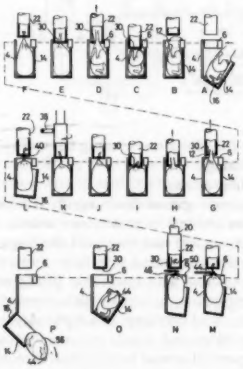
PCT No. PCT/DK81/00044, § 371 Date Dec. 29, 1981, § 102(e) Date Dec. 29, 1981, PCT Pub. No. WO81/03160, PCT Pub. Date Nov. 12, 1981

PCT Filed Apr. 28, 1981, Ser. No. 336,348

Claims priority, application Denmark, Apr. 29, 1980, 1832/80

Int. Cl.³ B65B *31/00*

U.S. Cl. 53—434 **9 Claims**



1. A method of closing bag packings for slaughtered poultry introduced head first into a flexible bag member comprising the steps of:

arranging the flexible bag member with the poultry therein in a bag holder means with an open mouth end of the bag member being at least located adjacent to a tubular portion of said bag holder means, introducing a tubular pressing piston means into said tubular portion, causing the free end of the open mouth end of the bag member to be sucked into an open end portion of said tubular piston means by effecting a suction therethrough, forcing said piston means against the leg ends of the poultry so that the leg ends are forwardly compressed in the flexible bag member, effecting a further suction action on the open mouth end of the bag member through said piston means, clamping the open mouth end of the bag member by clamping means located adjacent the front poultry engaging end of said piston means and rotating said clamping means relative to said bag holder means to twist said open mouth end of the flexible bag member outside said leg ends of the poultry, and fixing the twisted mouth end of the flexible bag member.

3. Apparatus for closing bag packings for slaughtered poultry, the apparatus comprising a bag holder means for receiving a bag member in which the poultry is head first introduced, a tubular bag holder means for receiving an open bag mouth portion and a leg end portion of the poultry, a piston means operable to be introduced into said tubular bag holder means for compacting the poultry by pressing the leg ends of the poultry inwardly in the bag member so that the leg ends of the poultry are forwardly compressed, a suction tube means operable to be introduced into said tubular holder means for causing a portion of the open bag mouth projecting beyond a rump portion of the poultry to be sucked into an outer end of said suction tube means, clamping means for mechanically seizing the bag mouth portion at a short distance outside the rump portion of the poultry, and means for mounting said clamping means so as to be rotatable relative to said bag holder means to effect a twisting of the bag mouth portions so as to enable a fixation of the twisted bag portion.

4,510,734

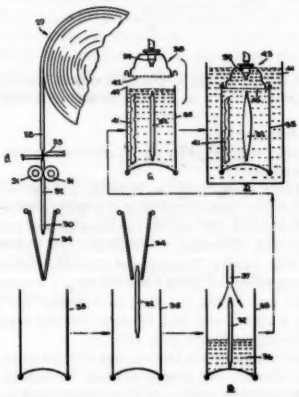
EXPANDABLE BAG AND METHOD OF MANUFACTURE

Russell Banks, Pawling, N.Y., and David J. Magid, Doylestown, Pa., assignors to Enviro-Spray Systems Incorporated, Montgomeryville, Pa.

Division of Ser. No. 172,357, Jul. 25, 1980, Pat. No. 4,376,500. This application Sep. 16, 1982, Ser. No. 419,073

Int. Cl.³ B65B *31/10, 5/02*

U.S. Cl. 53—449 **15 Claims**



1. The method of fabricating a fluid impervious expandable enclosed bag containing separately compartmented first and second gas generating components which, upon admixture in successive amounts, generate gas causing said bag to expand gradually from a collapsed condition to an ultimate fully expanded condition comprising the steps of:

(a) forming a group of pockets in a first plastic sheet, said pockets being aligned in a staggered series;

(b) fabricating a rupturable solvent containing means associated with said first sheet;

(c) introducing measured amounts of said first component into each pocket of said group;

(d) placing a second plastic sheet over said first group of pockets and releasably sealing it at least at its marginal areas to said first sheet;

(e) placing time release capsule containing said first component, and a measured amount of said second component on a portion of said first sheet spaced from all of said pockets; and

(f) permanently sealing a third plastic sheet to said first sheet

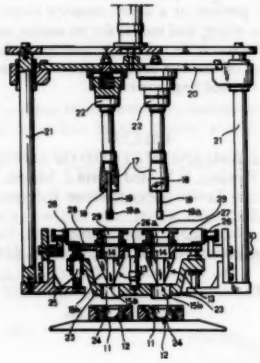
at the marginal areas of both and to said second sheet to provide a bag-like enclosure containing within its interior all of said compartments, and said second compartment.

4,510,735

WRAPPING OF SPHERICAL OBJECTS HAVING SMALL PROTRUSIONS

Lorenzo Cillario, Alba, Italy, assignor to Ferrero S.p.A., Alba, Italy

Filed Dec. 28, 1982, Ser. No. 454,065
Claims priority, application Italy, Dec. 30, 1981, 68723 A/81
Int. Cl.³ B65B *11/00*
U.S. Cl. 53—464 **6 Claims**



1. A machine for wrapping a spherical object having small protrusions distributed over its surface in alumium foil, comprising:

a supporting framework;

a first half-mould supported by the framework and having a hemispherical cavity;

a forming device comprising an annulus coaxial with the cavity of the first half-mould and a plurality of resilient blades each fixed at one end to the annulus and converging at their other, free ends towards the first half-mould;

a punch slidable axially through the forming device and having a hemispherical cavity constituting a second half-mould at its end facing the first half-mould, the punch comprising a central rod and an outer tubular body slidable axially relative to the rod, and

actuator means acting on the central rod and the outer tubular body to advance the central rod and the tubular body through the forming device in a predetermined periodic sequence between a withdrawn position, in which the punch and the first half-mould lie on opposite sides of the forming device, and an advanced position in which the second half-mould is in contact with the first half-mould.

6. A process for wrapping a spherical object having small protrusions distributed over its surface in thin aluminum foil, comprising the steps of:

(a) placing aluminum foil over a forming device including an annulus and a plurality of resilient blades each fixed at one end to the annulus, the resilient blades having free ends which converge below the annulus;

(b) depositing the object to be wrapped on the aluminum foil;

(c) pushing the object and the aluminum foil through the annulus and between the free ends of the resilient blades to cause adherence of the aluminum foil to the leading surface of the object and to partially wrap the object by affecting a first moulding of the aluminum foil around the trailing surface of the object;

(d) expelling the partially wrapped object through the converging blades, thereby first causing the blades to open out resiliently and thereafter to close due to the passage of the object through the converging free ends, to affect a second moulding of the aluminum foil around the trailing surface of the object and to form a rear, tail-like projection constituted by that part of the aluminum foil not adhering to the object;

(e) transferring the expelled object to a hemispherical cavity of a first half-mould; and

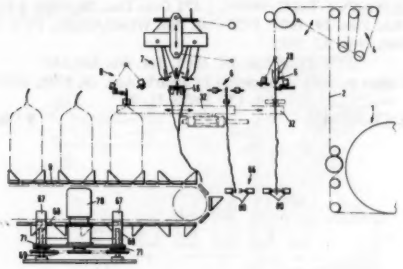
(f) squashing the rear projection of aluminum foil against the object by contacting the rear projection with a hemispherical cavity of a second half-mould.

4,510,736

MACHINE FOR FILLING AND CLOSING BAGS OF SYNTHETIC PLASTIC MATERIAL

Mathias Müller, Viersen, Fed. Rep. of Germany, assignor to Haver & Becker, Oelde, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,844
Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118866
Int. Cl.³ B65B *9/10*
U.S. Cl. 53—567 **30 Claims**



1. A machine for filling and closing bags of synthetic plastic material, comprising

lowerable filling means;

transporting means spaced downwardly from said lowerable filling means and intermittently movable in a longitudinal direction to support and transport the bags;

a pair of carriages mounted in a space between said transporting means and said lowerable filling means at a distance corresponding to a bag width, means for reciprocatingly moving said carriages in a horizontal plane between two end positions and synchronously with said transporting means parallel to said longitudinal direction so that the bags are arranged transverse to the movement direction of said pair of carriages;

stations for forming opening, filling and welding;

feeding means on said pair of carriages and having two feeding arms which are provided with gripping plates, means for moving said feeding arms in said opening station from an upper position to a central position toward each other to be inserted into a bag mouth, then to a lower position in the bag and then away from each other to spread the bag and after spreding the bag, moving said feeding arms with said gripping plates further downwardly mounted to a lower transporting position; and

two pairs of grippers arranged on said pair of carriages one pair being mounted on each side of said feeding means to grip bags below their mouth edges, one of said pairs of grippers being a front pair and arranged to bring an empty bag to said opening station, the feeding arms being arranged to bring a bag from said opening station to said filling station, and the other of said pairs of grippers being a rear pair and arranged for bringing a filled bag from said filling station to said welding station, so that three bags are

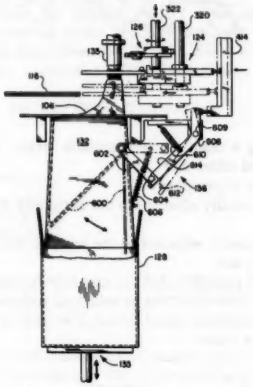
simultaneously transported by said pair of carriages so that during the filling of the central bag one bag is opened and the already filled bag is welded.

4,510,737

MACHINE AND METHOD FOR FILLING FLEXIBLE CONTAINERS

Roger H. Ellert, San Clemente, Calif., assignor to B-Bar-B, Inc., New Albany, Ind.

Filed Nov. 13, 1981, Ser. No. 321,153
Int. Cl.³ B65B *3/04, 43/40, 43/54*
U.S. Cl. 53—570 **4 Claims**



1. Apparatus for filling individual flexible containers severed from a continuous web of said containers and depositing containers so filled into supporting cartons, said containers each including a spout communicating with the interior of its associated container and having a separable capping device connected to said spout, said apparatus comprising:

means for receiving said continuous web of containers from a supply force, including means for engaging the spouts of said containers to position and align said web of containers and means for retaining said web of containers within said apparatus;

pusher means adapted to engage the spout of the leading container of said web for advancing said web so that the the spout of said leading container is positioned at a filling station;

container separating means for severing said leading container from said web;

filling means at said filling station for filling said severed leading container;

cap handling means for removing said capping device from said leading container prior to being filled and for replacing said capping device onto said leading container after it has been filled;

container discharge means, expanding in cross-sectional area toward the discharge end, for discharging a filled container under the influence of gravity; and

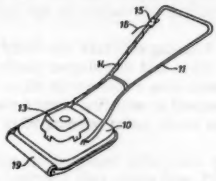
carton receiving means positioned under said discharge means for positioning a rigid carton such that the open end of said carton surrounds the expanded cross-sectional area end of said discharge means so as to receive a filled container within said carton.

4,510,738

AIR CUSHION LAWN MOWER

Kenneth Dunn, 70 Fulthorpe Ave., Mowden Park, Darlington, Co. Durham, England

Filed May 22, 1979, Ser. No. 41,533
Claims priority, application United Kingdom, May 22, 1978, 21042
Int. Cl.³ A01D *46/00*
U.S. Cl. 56—12.8 **6 Claims**



1. An air cushion lawn mower comprising:

a housing forming an air cushion hood;

a grass cutting blade shrouded by the housing and rotatable about a generally vertical axis;

a fan wheel rotatable about said axis for generating an air cushion beneath the hood;

a drive unit coupled to the blade and fan;

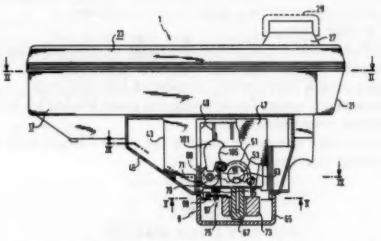
a non-weight bearing roller mounted on the housing adjacent one edge thereof and freely rotatable about an axis extending transversely to the normal direction of travel, which edge constitutes the front edge of the housing when the motor is propelled in its normal direction of travel, and said housing is provided with a peripheral lower rim which lies generally in a horizontal plane and has an upstanding lip, and wherein said roller axis is situated above said plane.

4,510,739

LAWN MOWER

Kurt Dluhosch, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs Ag, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 20, 1983, Ser. No. 516,116
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1982, 8221022[U]
Int. Cl.³ A01D *53/02*
U.S. Cl. 56—17.5 **9 Claims**



1. Lawn mower comprising:

(a) a vertical cutter shaft **3**, an internal combustion engine **5** for driving said vertical cutter shaft,

(b) a monolithic first shaped plastics part **17** in the form of a shell positioned above the top of said internal combustion engine **5**, said part **17** including a bottom, a circumferential wall **21** extending upwardly from said bottom, and a partition **25** dividing the interior of said part **17** into a fuel tank **7**, an air intake chamber **11**, **15**, **39**, air suction opening **33**, **41** and air passage openings **31**, **43** in said air intake cham-

ber **11**, **15**, **39**, and a fuel duct **69** extending downwardly from said fuel tank **7** and having a lower outlet opening **95**,

(c) monolithic second shaped plastics part **23** positioned on and above said first shaped plastics part **17**, said second part **23** secured in a liquid-tight and inseparable manner to said first shaped plastics part along said circumferential wall **21** and said partition **25**,

(d) a fan wheel arranged on the upper side of said internal combustion engine **5** for drawing air from said air intake chamber **11**, **15**, **39** arranged on the upper side of the internal combustion engine, and said fan wheel is driven about a vertical axis of rotation by said internal combustion engine **5**,

(e) a carburetor **9** having an intake pipe body **51** attached to said fuel duct **69** in said first shaped plastics part **17**, said carburetor comprising a fuel nozzle **63**, a float valve arrangement fastened to said first shaped plastics part and controlling the lower outlet opening **95** of said fuel duct **69**,

(f) a cover part removably mounted on said first shaped plastics part **17**, said cover part together with said first shaped plastics part **17** forming an air intake duct which connects said air intake chamber **11**, **15**, **39** with said intake pipe body **51**,

(g) an air filter arranged in said air intake duct formed by said cover part **45** and said first shaped plastics part **17**, and

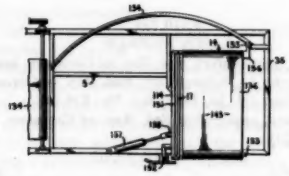
(h) a shut-off valve **71** located in said fuel duct **69**, said shut-off valve **71** having a valve body **79** rotatably mounted on said first shaped plastics part **17**.

4,510,740

TOBACCO HARVESTER

Ronald L. Foster, Rte. 1, Box 89, Dearborn, Mo. 64439

Filed Feb. 3, 1984, Ser. No. 576,881
Int. Cl.³ A01D *45/16*
U.S. Cl. 56—27.5 **33 Claims**



1. A tobacco harvesting apparatus comprising:

(a) a mobile frame;

(b) cutter means for severing the stalks of tobacco plants;

(c) impaler means for impaling said plants through their stalks onto a horizontally supported tobacco stick;

(d) stick pivot means for pivoting the plant loaded stick to a vertical orientation; and

(e) stick setter means for placing the plant loaded stick upstanding into the ground.

4,510,741

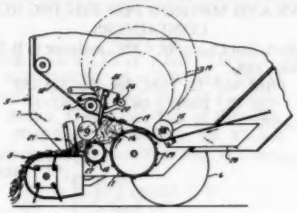
ROTARY CROP BALER

Hallis D. Campbell, and Donald E. Burrough, both of West Bend, Wis., assignors to Gehl Company, West Bend, Wis.

Filed Mar. 19, 1984, Ser. No. 591,275
Int. Cl.³ A01D *39/00*
U.S. Cl. 56—341 **9 Claims**

1. A rotary baler for cut crop, comprising a mobile frame having crop pickup means on a front portion thereof, crop guiding means near a front portion of the frame, behind the pickup means, to which crop is discharged by the pickup means and which comprises a feed roller over which the discharged crop passes and which is driven for rotation in a direction to deliver the crop rearwardly to a baling zone wherein the crop is rolled to form a cylindrical core that develops into a bale of growing diameter, endless bale compacting belt means, and a plurality of spaced apart belt rollers around which said belt means is trained, one of said belt rollers being located over said feed roller and another being spaced to the rear of said one, and said belt means being engaged upwardly against said one and said other of the belt rollers to have an expandable stretch extending between them that continuously embraces a growing bale, said baler being characterized by:

A. a bale forming roller that cooperates with said feed roller to support and roll crop in the baling zone, said bale forming roller



(1) having a diameter substantially larger than that of the said feed roller and

(2) having its periphery

(a) rearwardly adjacent to the periphery of said feed roller and

(b) forwardly adjacent to the periphery of said other belt roller; and

B. means for rotatably driving said bale forming roller

(1) in the same direction as said feed roller and

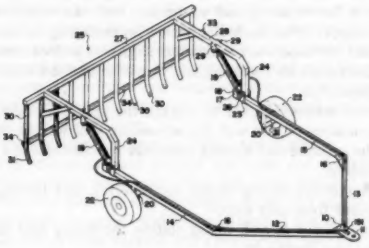
(2) at a peripheral speed which is at least as high as that of said feed roller.

4,510,742

FLAX STRAW BUNCHER

Alexander Lypka, Box 212, Abernethy, Saskatchewan, Canada S0A 0A0

Filed Apr. 20, 1984, Ser. No. 602,458
Claims priority, application Canada, Apr. 26, 1983, 426716
Int. Cl.³ A01D *85/00*
U.S. Cl. 56—384 **7 Claims**



1. A flax straw buncher comprising a hitch for attachment to a combine, a frame structure including a pair of hitch bars extending rearwardly and outwardly from the hitch, a pair of spaced side frame members extending rearwardly from said hitch bars in spaced parallel relationship, a pair of ground wheels each attached separately to a respective one of said side frame members for supporting the frame structure at spaced positions rearwardly of and on either side of the hitch, a transverse rake portion including plurality of depending fingers for engaging and raking the ground, means mounting the rake

portion on the frame structure including a pair of arms each extending forwardly from the rake portion such that the space defined upwardly and in front of the rake portion and inwardly of the hitch bars and side frame members is free from encumbrances whereby the rake portion provides the only transverse interconnecting member across the frame structure adjacent the ground wheels, whereby a bunch of said flax straw can be formed in said space in front of the rake portion, and means mounting each of said forwardly extending arms for pivotal movement on a respective one of the side frame members whereby the whole of the rake portion can be raised relative to the frame structure to release a bunch formed in front of the rake portion.

4,510,743
ROPE COMPRISING TWO OR MORE POLYMER COMPONENTS

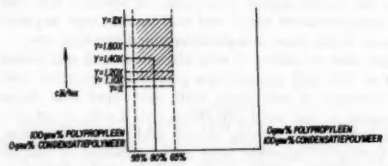
Jan de Kroon, Wijk bij Duurstede, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 128,090, Mar. 7, 1980, abandoned, which is a continuation of Ser. No. 851,769, Nov. 15, 1977, abandoned. This application Jul. 2, 1982, Ser. No. 394,657

Claims priority, application Netherlands, Nov. 26, 1976, 7613193

Int. Cl.³ D02G *3/02, 3/22*

U.S. Cl. 57—260 **4 Claims**



1. A split-fiber rope composed of at least one helically extending bundle of threads, said threads consisting of a composite elongated product comprising at least two synthetic polymer components, one of the polymer components being present in an amount of from 75 to 85% by weight of polypropylene and the second polymer component in an amount of from 25 to 15% by weight, based on the total weight of the composite product, of a polyester substantially formed of polyethylene terephthalate having a melting point which is at least 15 Centigrade degrees higher than the melting point of said polypropylene, said polyester being distributed in the polypropylene with at least a part thereof being in the form of fibrils, a large number of the fibrils having a length of at least 0.1 mm and a thickness of not more than 0.005 mm, said composite elongated product having been drawn in at least two stages, the draw ratio in the first stage not being higher than 4 and the total draw ratio not being higher than 14, which composite elongated product is present in the rope substantially in the form of split fibers and in its oriented state having a tensile strength of 1.2 times to 2 times the tensile strength of a practically 100 percent polypropylene product having a melt index of 3 and a tensile strength of at least 45 cN/tex and made in the same way as the said composite elongated product.

4,510,744
APPARATUS FOR FALSE TWISTING YARN

Christopher J. Lawrence, Macclesfield; Philip M. Wilkinson, Cheadle, and Colin Atkinson, Macclesfield, all of England, assignors to Rieter-Scragg Limited, Cheshire, England

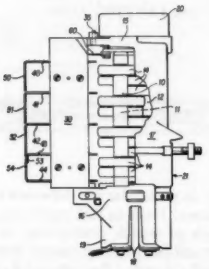
Filed Jun. 1, 1983, Ser. No. 500,002

Claims priority, application United Kingdom, Jun. 1, 1982, 8215876

Int. Cl.³ D02G *1/08;* D01H *15/00*

U.S. Cl. 57—280 **25 Claims**

1. In an apparatus for false twisting yarn comprising three rotatable, parallel shafts arranged at the apices of an equilateral triangle, a plurality of mutually parallel coaxial discs forming a disc stack carried by each shaft and said discs being arranged on a helix around a central axis parallel with said shafts with consecutive discs on two shafts being separated by a space and a disc on the third shaft being disposed in said space; a threading device comprising a body secured in said apparatus to extend substantially in parallel with said axis and having a plurality of yarn engaging tines mounted thereon and spaced longitudinally thereof, each tine being movable relative to said body from a respective first position outside the extent of said plurality of discs to a respective second position within the said space, at least some of said tines being movable independently of the remaining ones of said tines.



14. For use with false twisting apparatus of the kind comprising three rotatable parallel shafts arranged at the apices of a triangle and having a plurality of parallel discs on each shaft which interdigitate with the discs on the other two shafts, a threading device comprising a plurality of yarn engaging tines each of which is movable from an inoperative position outside the extent of the series of discs to an operative position in which it extends into a space between consecutive discs on two of the shafts as separated by a disc on the third shaft, at least some of the tines being movable into their operative positions independently of the other tines, whereby, during use of the threading device, a false twisting apparatus with which the device is being used can be threaded in sequential stages.

4,510,745
OPEN-END SPINNING UNIT

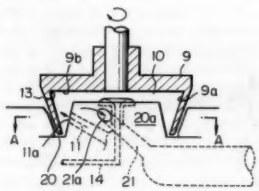
Susumu Kawabata, Aichi; Tetsuzo Inoue, Nagoya; Noriaki Miyamoto, Toyota; Masanobu Shibuya, Kariya, and Masashi Kaneko, Tokai, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, both of Aichi, Japan

Filed Jun. 21, 1983, Ser. No. 506,327

Claims priority, application Japan, Jun. 21, 1982, 57-105471

Int. Cl.³ D01H *7/882, 7/898*

U.S. Cl. 57—415 **9 Claims**



1. An open-end spinning unit comprising a spinning rotor open on one side thereof and having a bottom wall and an inner wall which define a chamber; and a closing element covering the open side of the rotor and containing a fiber supply duct

having an utlet opening which opens into the chamber of said closing element, and at least one suction opening disposed downstream, relative to the rotation of said rotor, of said outlet opening of said fiber supply duct and which opens into said chamber, whereby an airstream directed in the same direction as the rotation of said rotor is generated from said outlet opening to said at least one suction opening.

4,510,746

FLEXIBLE BAND

Gerhard Ratz, Keltern, Fed. Rep. of Germany, assignor to Rodi & Wienenberger, Pforzheim, Fed. Rep. of Germany

Filed Aug. 29, 1983, Ser. No. 527,310

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 8224660[U]

Int. Cl.³ F16G *13/00*

U.S. Cl. 59—79.1 **2 Claims**

1. A flexible band, in particular a wristwatch strap, comprising: an upper and lower layer of link members; a plurality of U-shaped clips, each of which connecting an upper and a lower link member and having two shanks respectively provided with an inwardly directed flexure; and a plurality of leaf springs each of which extending within an associated link member and having a further inwardly directly flexure at opposing end portions thereof for cooperating with an associated flexure of the clip and the end portions of each of the leaf springs are downwardly inclined so as to facilitate insertion of the respective clips and connection of the upper and lower link, wherein each of the link members has an inner side provided with a recess at each end thereof, wherein each of the link members is provided with an additional cut-out at each end and in the vicinity of each recess with each cut-out being separated from each other so that upon stretching of the band the ends of the respective leaf spring protrude into the recess and the further flexure of each leaf spring protrudes into the cut-out.

4,510,747

LOCKUP CONTROL DEVICE FOR A TORQUE CONVERTER

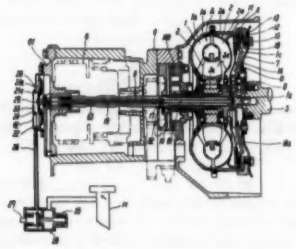
Ryo Yoshida, Ikeda, Japan, assignor to Daihatsu Motor Company Limited, Osaka, Japan

Filed Nov. 23, 1981, Ser. No. 324,052

Claims priority, application Japan, Dec. 12, 1980, 55-176184; Dec. 28, 1980, 55-188086

Int. Cl.³ F16D *33/00*

U.S. Cl. 60—343 **7 Claims**



1. A lockup control device for a torque converter provided with a pump coupled with an output shaft of an engine and a turbine coupled with an input shaft of a transmission gear, comprising:

a lockup clutch for connecting said pump directly with said turbine at said torque converter, said lockup clutch comprising a clutch piston, a clutch disc engageable therewith, and a lockup clutch control chamber which is positioned between the piston and the disc and controls the engagement of said piston with said disc;

a clutch operating device provided with a control member for engaging or disengaging said clutch;

an operating member for operating said control member, said input shaft coupling with said turbine being provided with an oil passage having a drain, said oil passage communicating with said lockup clutch control chamber and having an on-off valve for opening or closing said drain;

an actuating device for electrically actuating said operating member, said actuating device being provided with a car speed detector for detecting a car speed to output a plurality of car speed signals, a negative pressure detector for detecting a negative pressure in a suction pipe at said engine, and an actuating member which electrically actuates said operating member in response to said car speed signals and negative pressure signals output from said car speed and negative pressure detectors, so that said clutch is engaged when said car speed is greater than or equal to a predetermined speed and said suction pipe negative pressure is greater than or equal to a predetermined pressure, and is disengaged when said car speed is less than said predetermined speed and said suction pipe negative pressure is less than said predetermined pressure; and

said input shaft extending in axial alignment with said output shaft so that said transmission gear is incorporated with the extension of said input shaft, said input shaft being supported at one axial end thereof to a side cover of a transmission case housing therein said transmission gear, and having an insertion bore in continuation of said oil passage and open at the axial end of said input shaft at the side cover side, said insertion bore supporting an operating rod acting as said operating member which controls said on-off valve to open and close the same.

4,510,748

COMPRESSION WAVE FORMER

Joseph S. Adams, 404-1617 W. Fourth Ave., Vancouver, British Columbia, Canada

Division of Ser. No. 091,150, Nov. 5, 1979, Pat. No. 4,365,471. This application Sep. 20, 1982, Ser. No. 419,749

The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.

Int. Cl.³ F02C *5/02*

U.S. Cl. 60—39.02 **8 Claims**

1. A method of dynamically compressing and detonating a fuel and air mixture, said method comprising:

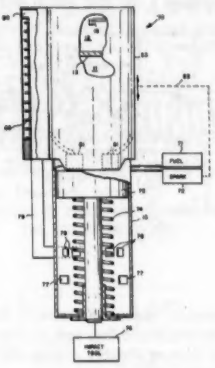
a. confining said fuel and air mixture within an ignition chamber and an adjacent detonation chamber having a constricted output opening spaced from said ignition chamber;

b. igniting said mixture within said ignition chamber;

c. directing flames from combustion within said ignition chamber into said detonation chamber through at least three passageways to form at least three flame jets jutting into said detonation chamber; and

d. directing said flame jets along spaced-apart regions of an outer periphery of said detonation chamber to initiate combustion of said fuel and air mixture simultaneously in each of said spaced-apart peripheral regions, said simultaneously initiated combustion starting a combustion expansion that widens said combustion regions to join each other and advances said combustion regions toward a central region of said detonation chamber where said advancing combustion dynamically compresses said fuel and air mixture so that said advancing combustion accelerates through said dynamically compressed mixture, result-

ing in shortening the time lapse from said ignition to peak pressure in said detonation chamber and concentrating the



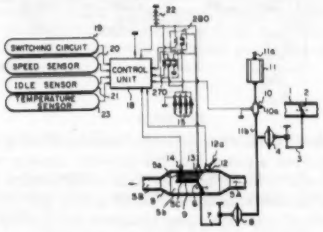
heat of said combustion in said central region where it is spaced from said outer periphery of said detonation chamber.

4,510,749

EXHAUST GAS PURIFIER FOR A DIESEL ENGINE

Masahiro Taguchi, Okazaki; Satosi Kuwakado, Aichi, and Noboru Tsuge, Kariya, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 1, 1982, Ser. No. 438,345
Claims priority, application Japan, Nov. 5, 1981, 56-176417
Int. Cl.³ F01N *3/02*
U.S. Cl. 60—286 **4 Claims**



1. An exhaust gas purifier for a diesel engine having a throttle valve provided in an intake passage for reducing the flow rate of intake air during engine idling, said exhaust gas purifier comprising:

a housing having an exhaust gas inlet and outlet, said housing having a main passage extending from said inlet to said outlet and a passage bypassing at least part of said main passage;

means disposed in said bypass passage for oxidizing unburned combustibles in the exhaust gas passed therethrough;

a control valve arranged in said main passage to close said main passage such that all of the exhaust gas is forced to flow through said bypass passage; and

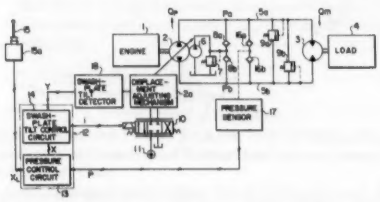
means for closing said control valve in synchronization with a closure of said throttle valve during engine idling.

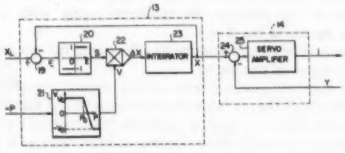
4,510,750

CIRCUIT PRESSURE CONTROL SYSTEM FOR HYDROSTATIC POWER TRANSMISSION

Eiki Izumi; Hiroshi Watanabe; Yukio Aoyagi; Kazuo Honma, and Kichio Nakajima, all of Ibaraki, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1981, Ser. No. 270,569
Claims priority, application Japan, Jun. 4, 1980, 55-74220; Aug. 6, 1980, 55-107143; Aug. 22, 1980, 55-114773
Int. Cl.³ F16D *33/02*
U.S. Cl. 60—443 **5 Claims**





1. A circuit pressure control system for a hydrostatic power transmission including a variable-displacement hydraulic pump driven by a prime mover, a hydraulic actuator for actuating a load and a displacement adjusting mechanism for the hydraulic pump, the hydraulic pump and hydraulic actuator being connected together in a closed or a semi-closed circuit, and the displacement adjusting mechanism being actuated by a signal indicative of an operating lever manipulated variable and a signal indicative of the actual displacement of the hydraulic pump to control the speed of the hydraulic actuator, said circuit pressure control system comprising:

means for sensing at least a higher one of a circuit pressure in discharge and suction sides of the hydraulic pump and generating a signal indicative of the sensed circuit pressure;

means for calculating, based on said manipulated variable signal and said signal indicative of the sensed circuit pressure, a hydraulic pump displacement command which causes the displacement of the hydraulic pump to be changed at a maximum rate when the circuit pressure is below a predetermined value and causes the rate of change of the pump displacement to be reduced when the predetermined value is exceeded thereby said means for calculating the hydraulic pump displacement command including first means for converting said sensed circuit pressure signal to a value indicative of the rate of change in the displacement of the hydraulic pump based on a preset function whih predetermines the above relations between the circuit pressure and the rate of change in the displacement of the hydraulic pump, and second means for converting said value indicative of the rate of change in the pump displacement to a value indicative of the displacement of the hydraulic pump to thereby obtain said hydraulic pump displacement command; and

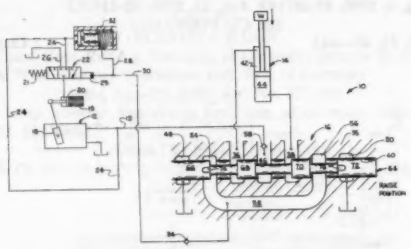
means for comparing the displacement command with the actual displacement of the hydraulic pump and producing a signal for decreasing the difference between them and supplying such signal to said displacement adjusting mechanism.

4,510,751

OUTLET METERING LOAD-SENSING CIRCUIT

Alan D. Jackson, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Apr. 22, 1982, Ser. No. 370,887
Int. Cl.³ F16H *39/46*
U.S. Cl. 60—450 **5 Claims**



1. A load sensing meter-out hydraulic system controlling a motor, supplied by the output of a variable displacement pump through a directional control valve, the system including:

a pilot flow pressure source comprising a line connected to the output of the variable displacement pump with a flow restriction means in the line;

a flow control cylinder attached to the pump for varying the flow output of the pump;

a servo actuated pump compensating means connected to the output of the variable displacement pump and a drain for controlling the flow to and from the control cylinder;

a directional control valve having a bore which is intersected by a pump pressure cavity supplied by the variable displacement pump, first and second motor port cavities, a return cavity and a signal cavity between each of the motor port cavities and the return cavity;

a signal line connecting the servo of the pump compensating means to the signal cavity of the valve including a check valve blocking flow from the signal cavity to the servo;

a supply line from said pilot flow pressure source supplying the signal line between the check valve and said servo whereby the pressure in the signal cavity of the valve is sensed at the servo of the pressure compensating means, so that the pump discharge can be varied through the compensating cylinder to maintain a constant pressure in the signal cavity of the valve; and

a spool means in the directional control valve having a first position opening pump pressure to a first motor port while opening the second motor port to the signal cavity and metering the signal cavity to drain.

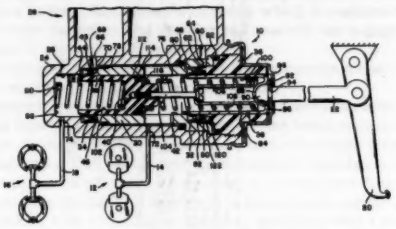
4,510,752

MASTER CYLINDER

Robert F. Gaiser, Stevensville, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 10, 1981, Ser. No. 282,346
Int. Cl.³ B60T *11/20*
U.S. Cl. 60—562 **4 Claims**

1. A master cylinder for a brake system having a housing defining an axially extending bore, a first piston movable within the bore by an input member engaged therewith, and a second piston movably disposed within the bore and cooperating with the first piston to form a first pressure chamber, the second piston also cooperating with the housing to form a second pressure chamber, characterized by said first piston comprising a thin walled cup shaped member with a longitudinal body extending axially from a base, said longitudinal body defining a cavity forming a portion of said first pressure chamber, said cup shaped member being stamped from a metal to form a substantially uniform dimension for said thin wall, said second piston being made from a molded plastic whereby the master cylinder provides different materials for said first and second pistons, and said first and second pistons are made by different processes, the housing including a sleeve fixedly disposed within the bore in order to define fixed positions for a first lip seal engaging the first piston and a second lip seal



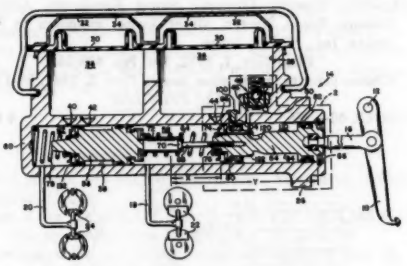
engaging the second piston, said sleeve defining a uniform diameter bore between said first and second lip seals and said first and second pistons slidably engage the wall of said uniform diameter bore.

4,510,753

MASTER CYLINDER

John E. Steer, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 274,336, Jun. 17, 1981, abandoned.
This application Apr. 11, 1984, Ser. No. 599,101
Int. Cl.³ B60T *11/08*
U.S. Cl. 60—578 **2 Claims**



1. A master cylinder comprising a housing defining a cylinder bore therein, a piston member movably diposed within a portion of said cylinder bore for axial reciprocation therein, said piston member sealingly cooperating with said housing to bound a pair of variable-volume chambers for holding a fluid, passage means for communicating said pair of variable-volume chambers, said piston member being movable relative said housing to contract said pair of variable-volume chambers and to communicate pressurized fluid from one of said pair of variable-volume chambers to the other of said pair of variable-volume chambers, means cooperating with said piston to provide for contraction of said one variable-volume chamber when said piston is movable relative to said housing, characterized in that said bore portion is of a constant diameter, said means comprising an annular partition member disposed substantially immovably within said bore portion and circumscribing said piston member, said partition member sealingly cooperating with said housing and with said piston member via a sealing member to bound said one variable-volume chamber, with said partition member including a pair of identical C-shaped members which each include cooperating means for interlocking with the other and said pair of C-shaped members cooperating with said sealing member to form coacting means

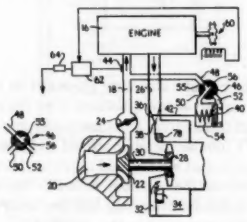
for interlocking said C-shaped members with said sealing member, said cooperating means includes a radially extending tongue defined at one end of said C-shaped members and a radially extending groove defined at the opposite end of said C-shaped members, said groove of each C-shaped member receiving the tongue of the other C-shaped member to axially interlock therewith and prevent axial movement between said pair of identical C-shaped members.

4,510,754

TURBOCHARGER AND EXHAUST GAS CONTROL THEREFOR

Christian J. Rahnke, Orchard Lake, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 2, 1983, Ser. No. 500,488
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—602 **14 Claims**



1. A turbocharger for boosting the pressure of gas inducted by an internal combustion engine having an exhaust gas outlet comprising:

a driveshaft mounted for rotation;

a turbine inlet

a turbine rotor and a compressor rotor fixed to the driveshaft;

passage means including first and second passages for connecting the engine exhaust gas outlet to the turbine inlet; and

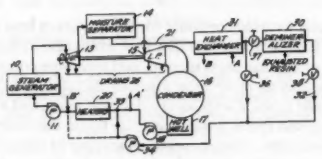
closing means for alternately connecting the engine exhaust gas outlet to the first passage and disconnecting the engine exhaust gas outlet to the second passage and for connecting the engine exhaust gas outlet to the second passage and disconnecting the engine exhaust gas outlet to the first passage.

4,510,755

DEMINERALIZATION OF FEED WATER IN A STEAM SYSTEM

Russell J. Gartmann, Delran, N.J., and James S. Brown, St. Simons Island, Ga., assignors to Transamerica DeLaval Inc., Princeton, N.Y.

Filed Aug. 10, 1983, Ser. No. 521,659
Int. Cl.³ F01K *13/00*
U.S. Cl. 60—657 **12 Claims**



1. In a feed water-recovering steam-generating system (a) wherein a moisture-separator processes the exhaust products of one stage of steam utilization for use at another stage at reduced temperature and pressure, (b) wherein one of the outputs of the moisture-separator is mechanically separated liquid at relatively high temperature and pressure, (c) wherein another of the outputs of the moisture-separator is steam used in the other stage before discharge to a condenser for condensing the utilized steam to a relatively low-temperature condensate, and (d) wherein the condensate is accumulated in a hot well prior to pumped extraction for recycled use via the feed water line to the steam generator,

the improvement in which:

(1) a filter demineralizer has an inlet-line connection to the mechanically separated liquid output of said moisture separator, and

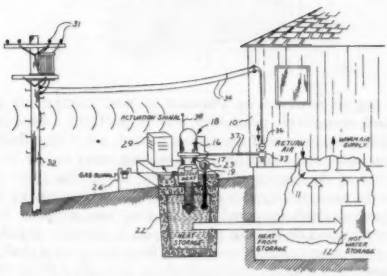
(2) the outlet of said filter demineralizer is connected to the feed water line at a location downstream from where the accumulated hot-well condensate is pumped into the feed water line.

4,510,756

COGENERATION

Ralph E. Hise, and Paul F. Swenson, both of Shaker Hts., Ohio, assignors to Consolidated Natural Gas Service Company, Inc., Cleveland, Ohio

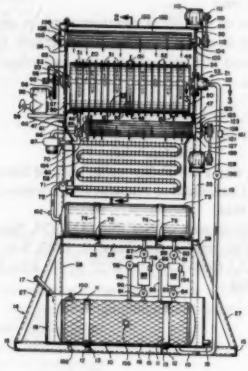
Continuation-in-part of Ser. No. 323,174, Nov. 20, 1981, abandoned. This application Nov. 8, 1982, Ser. No. 439,520
Int. Cl.³ B60H *1/02*; H02P *9/04*; F24D *3/02*
U.S. Cl. 60—659 **18 Claims**



1. A cogeneration plant at a local site operating under the priority of supplying substantially all of its expected daily thermal load requirement which varies throughout a 24-hour period, the plant including a heat engine, a source of combustible fuel for driving the engine, electric power generating means for converting mechanical energy of the heat engine to electrical power, means interconnecting the electrical power generating means to an electrical utility grid, the utility grid experiencing a load that regularly varies significantly in magnitude throughout a 24-hour period and is characterized by a peak demand period which is substantially less than 24 hours, a heat storage unit having a capacity sized in accordance with the expected daily thermal load requirement, first means thermally connecting the engine to the heat storage unit for conducting heat energy rejected by the heat engine to the storage unit, second means thermally connecting the heat storage unit to the thermal load, control means for energization of the heat engine and generating means ordinarily exclusively during the peak rate period of the utility, and sensing means monitoring the heat value stored in the storage unit and arranged to normally override said control means when said storage unit contains a desired capacity of heat to discontinuous operation of said heat engine and generating means, said heat engine and generating means forming a set sized to run primarily through the peak rate period to develop a quantity of rejected heat equivalent to the modified design day thermal load of the site, said sensing means and control means being mutually arranged to normally assign priority of operation of said heat engine and generating means ordinarily exclusively to the condition where, during the peak demand period, the expected following

24-hour heat demand is greater than the quantity of heat contained in the heat storage unit.

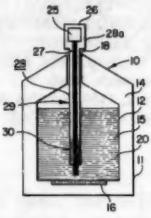
4,510,757
HEAT ENGINE
Merrill E. Graham, Jr., P.O. Box 545, Tehachapi, Calif. 93561
Filed Jan. 3, 1984, Ser. No. 567,799
Int. Cl.³ F22D *5/00*
U.S. Cl. 60—667 **18 Claims**



1. An engine powered by a source of heat, comprising a heating tank operatively positioned with respect to a source of heat so that the contents of the tank is heated; a working fluid within the tank, such fluid having a boiling point below the temperature of the source of heat so that when the fluid is heated in the tank, it becomes pressurized; a turbine having a hollow central shaft mounted for rotation and adapted to receive pressurized fluid from the tank and a plurality of hollow vanes extending radially outwardly from the central shaft, said hollows of the vanes communicating with the hollow of the shaft and being open at their opposite ends so that said pressurized fluid flows from the shaft through the vanes and out the ends of the vanes, the openings at the ends of the vanes directing said fluid from the vanes to cause rotational movement of the vanes and shaft; a housing about the turbine to collect and confine the fluid flowing from the turbine; storage means for storing the collected fluid; means for connecting the turbine housing and storage means so said fluid can flow from the turbine housing into the storage means; at least one pressure equalization tank in flow communication with both the storage means and the heating tank; first valve means to control the flow of fluid from the storage means into the pressure equalization tank; second valve means to control the flow of fluid from the pressure equalization tank into the heating tank; equalizing means connecting the top of the heating tank and the top of the pressure equalization tank to allow for pressure equalization between the two tanks; and third valve means in the equalizing means to control when pressure equalization takes place so that the fluid in the storage tank can flow into the equalizing tank, be pressure equalized, and flow into the heating tank to be again heated and circulated through the system.

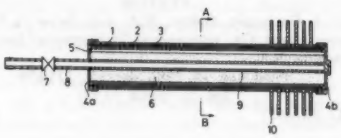
4,510,758
CONVERTIBLE CRYOSTAT
Orren K. Tench, Jr., Wethersfield, Conn., assignor to Canberra Industries, Inc., Meriden, Conn.
Filed Jun. 20, 1983, Ser. No. 505,725
Int. Cl.³ F17C *1/00*
U.S. Cl. 62—45 **5 Claims**

1. An improved cryostat having a plurality of ports for accepting devices to be maintained at low temperature comprising a Dewar container having an inner vessel for containing a cryogen in a liquid state and an outer vessel joined to said inner vessel to define a volume therebetween for evacuation, said Dewar having a top opening through which the cryogen may evaporate and into which a device chamber may be inserted to become at least partially immersed in the cryogen and at least one additional port for accepting a device chamber which port extends through said inner and outer vessels, said



second port including a tube structure closed at its inner end, sealed to the inner wall so as to be isolated from the interior of said inner vessel and terminating at its inner end in a heat sink, said port including a tubular member affixed and sealed to said tube and to the other vessel wall of said cryostat thereby maintaining the intergrity of the vacuum between the inner and outer vessel walls, said tube extending into the inner container to be at least partially immersed in the cryogen.

4,510,759
METALHYDRIDE CONTAINER AND METAL HYDRIDE HEAT STORAGE SYSTEM
Takashi Sakai; Naojiro Honda, and Ikuo Yonezu, all of Hirakata, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan
Filed Sep. 14, 1982, Ser. No. 418,029
Claims priority, application Japan, Sep. 17, 1981, 56-145601; Sep. 17, 1981, 56-145602
Int. Cl.³ F17C *13/02*; F28D *13/00*
U.S. Cl. 62—48 **4 Claims**

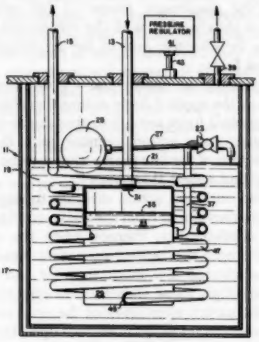


1. A metal hydride container for use in storing heat from and releasing heat to a medium in a heat exchanger, comprising a heat pipe of annular cross section, said heat pipe comprising an outer tube and an inner tube together defining a sealed space between said tubes, a wick inserted in said space and a working fluid filling said space, a metal hydride filling the central cavity of said inner tube, closure members serving to close the openings at the opposite ends of said central cavity, a hydrogen passage tube possessed of a shut-off valve and fitted into an aperture formed in one of said closure members, and communicated with the central cavity of the inner tube through a partition member pervious to hydrogen gas and ipervious to said metal hydride.

4,510,760
COMPACT INTEGRATED GAS PHASE SEPARATOR AND SUBCOOLER AND PROCESS

Rolf H. Wieland, Norristown, Pa., assignor to Messer Griesheim Industries, Inc., Valley Forge, Pa.

Filed Mar. 2, 1984, Ser. No. 585,523
Int. Cl.³ F17C *13/02*
U.S. Cl. 62—49 **8 Claims**



1. A compact integrated gas phase separator and subcooler for removing gas phases from a liquid gas and subcooling the liquid gas, comprising

subcooler means for subcooling a liquid gas,

said subcooler means including a subcooler container having a cold bath of liquid gas,

gas separator means for removing gas phases from a liquid gas,

said separator means including a separator container positioned inside the subcooler container in the cold bath,

means for passing a liquid gas from a liquid gas supply line into the phase separator container,

heat exchanger means for subcooling the liquid gas including coils extending from the phase separator through the cold bath in the subcooler container,

transfer means for passing the gas phases and liquid gas from the separator including a float valve extending from the separator container into the subcooler container with a float floating on the surface of the cold bath in the subcooler,

said heat exchanger means also being adapted for opening the float valve by heating the liquid gas in the subcooler bath to evaporate some of it and lower the level of the surface of the subcooler bath,

said transfer means also being adapted for closing the float valve by passing liquid gas from the separator container into the subcooler to raise the level of the surface of the subcooler bath.

4,510,761
ICE MAKING MACHINE WITH REVERSE DIRECTION HOT GAS THAWING AND PRESSURIZED GAS DISCHARGE

James H. Quarles, 818 Woodmore La., Chattanooga, Tenn. 37411

Continuation-in-part of Ser. No. 379,830, May 19, 1982, Pat. No. 4,455,843, which is a continuation-in-part of Ser. No. 236,432, Jun. 21, 1981, abandoned. This application Apr. 12, 1983, Ser. No. 484,347
Int. Cl.³ F25C *5/10*
U.S. Cl. 62—73 **24 Claims**

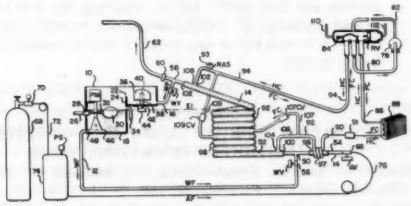
1. An ice making machine including:

means defining a water circuit, said water circuit including a tube wherein ice is formed;

means for introducing water into said water circuit;

means defining a refrigeration circuit, at least a portion of said refrigeration circuit disposed in heat exchange relationship about at least a portion of said tube;

means for circulating a refrigerant through said refrigerant circuit, wherein in a freezing cycle said refrigerant circulation means is adapted to circulate cold refrigerant in a first direction through said refrigerant circuit, whereby heat exchange between water in said tube and said refrigerant causes the formation of a deposit of ice on an inner wall of said tube, said first direction being from a first end of said tube to a discharge end thereof, wherein in a harvest cycle said refrigerant circulation means is further adapted to circulate hot refrigerant in a second direction through said refrigerant circuit, whereby the outer periphery of ice formed in said tube is sufficiently thawed and loosened to facilitate the discharge of ice from said tube, wherein said first direction is opposite said second direction, said means for circulating said refrigerant through said refrigerant circuit comprising a four-way valve having a first port connected to a condensor included in said refrigerant circuit, a second port connected to a first port of a refrigerant compressor, a third port connected to a



second port of a refrigerant compressor, and a fourth port connected to a portion of said refrigerant circuit which is in heat exchange relation with said water circuit, said first port of said four-way valve being selectively communicable with said second and third ports thereof, said second port of said four-way valve being selectively communicable with said first and fourth ports thereof, and said third port of said four-way valve being selectively communicable with said first and fourth ports thereof;

a one-directional pressure valve and a refrigerant reservoir connected between said condensor and said portion of said refrigerant circuit which is in heat exchange relation with said water circuit, said one-directional pressure valve being adapted to permit refrigerant to flow therethrough and into said refrigerant reservoir when a sufficiently high pressure differential exists across said one-directional pressure valve, said refrigerant reservoir being connected to said condensor;

sensor means for determining when ice is sufficiently formed in said tube;

means for initiating said harvest cycle; and,

means for discharging ice from said tube.

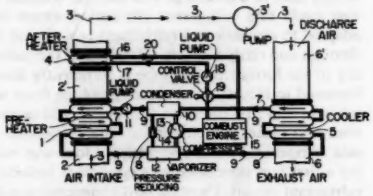
4,510,762
HEAT RECOVERY METHOD

Fritz Richarts, Stolberg-Breinig, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,106
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1982, 3222406
Int. Cl.³ F25B *7/00*
U.S. Cl. 62—79 **6 Claims**

1. A method for recovering heat by means of a heat carrier circulatory system from a fluid passing through different temperature stages, wherein the entrance temperatures of a heat carrier into a preheater and into a cooling device in said circulatory system are changed by means of a heat pumping process, comprising the following steps:

(a) passing the heat carrier through a discharge air cooling device (5) for heating the heat carrier;
(b) further passing said heat carrier from said discharge air cooling device (5) through a condenser (10) of a heat pump (13) for further heating said heat carrier,
(c) passing said further heated heat carrier through a preheater (1) for cooling the heat carrier; and



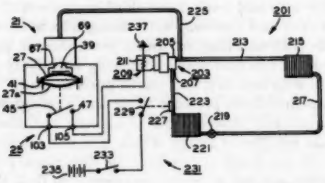
(d) further passing the cooled heat carrier from the preheater (1) through a vaporizer (12) of said heat pump for further cooling said heat carrier before returning the heat carrier to said discharge air cooling device (5), whereby the heat carrier is heated twice and cooled twice in a closed circulatory system.

4,510,763

AUTOMOTIVE TYPE AIR CONDITIONING SYSTEM AND METHOD OF OPERATING SUCH

Ronald L. Johnson, Prophetstown, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 411,296, Aug. 25, 1982, Pat. No. 4,458,117.
This application Dec. 29, 1983, Ser. No. 566,846
Int. Cl.³ F25B *49/00*
U.S. Cl. 62—115 **8 Claims**



2. A method of operating an automotive type air conditioning system having a refrigerant compressor with a discharge side and a suction side connected in the system and operable generally for circulating refrigerant through the system, a clutch device adapted for actuation in driving relation with the compressor, coil means associated with the clutch device and adapted for energization to actuate the clutch device, an electrical circuit device, an electrical circuit having a DC power source arranged in circuit relation with the coil means, and a control device including an expansible chamber connected in refrigerant pressure fluid communication in the system at least generally at the discharge side of the compressor, a pair of snap action members adapted for operation with discrete snap action movement between a stable configuration and an unstable configuration, the snap action members having a pair of peripheral portions engaged at least in part with each other and a pair of generally dome-shaped sections integral with the peripheral portions arranged in opposite facing relation with each other, respectively, means for seating at least in part generally about one of the dome-shaped sections of one of the snap action members, diaphragm means defining a part of the chamber, a spacer arranged in force transmitting engagement between the diaphragm means and the other of the dome-shaped sections of the other of the snap action members, at least one switch element movable between a closed circuit position and an open circuit position, and abutment means associated in following engagement between the one dome-shaped section of the one snap action member and the one switch element and with the one switch element being connected in the electrical circuit in circuit relation between the DC power source and the coil means, the method comprising the steps of:

subjecting the diaphragm means to the refrigerant fluid pressure in the chamber with the refrigerant fluid pressure acting on the effective area of the diaphragm to establish an applied force;

biasing conjointly the spacer and the diaphragm means in response to the applied force acting thereon and transmitting the applied force onto the other dome-shaped section of the other snap action member with the one dome-shaped section of the one snap action member being seated by the seating means therefor;

operating the one snap action member through its discrete snap action movement from the stable configuration to the unstable configuration thereof when the applied force transmitted onto the other snap action member attains at least a preselected low value therefor and is less than a preselected high value therefor and effecting the movement of the switch element from the open circuit position to the closed circuit position thereof upon the operation of the one snap action member to its unstable configuration;

completing the circuit from the DC power source to the coil means when the switch element is in its closed circuit position and energizing the coil means in the circuit;

actuating the clutch device into the driving relation thereof with the compressor in response to the energization of the coil means in the circuit and effecting thereby the operation of the compressor in the system to circulate refrigerant therethrough from the discharge side to the suction side of the compressor;

operating the other snap action member through its discrete snap action movement from the stable configuration to the unstable configuration thereof so as to drivingly engage and return the one snap action member to its stable configuration in the event the applied force transmitted onto the other snap action member is increased to the preselected high value thereof and alternatively effecting the return of the one snap action member to its stable configuration in the event the applied force transmitted onto the other snap action member is decreased to the preselected low value thereof without operating the other snap action member;

effecting the return of the switch element from the closed circuit position to the open circuit position thereof in response to the return of the one snap action member to its stable configuration;

interrupting the circuit from the DC power source to the coil means when the switch element is in its open circuit position and deenergizing the coil means; and

deactuating the clutch device so as to effect its uncoupling from the compressor in response to the deenergization of the coil means in the circuit and terminating thereby the operation of the compressor in the system.

4,510,764

CONTROL METHOD FOR AIR CONDITIONING SYSTEMS FOR VEHICLES

Nobuhiko Suzuki, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan

Filed Nov. 28, 1983, Ser. No. 555,475
Claims priority, application Japan, Dec. 3, 1982, 57-212530
Int. Cl.³ B60H *3/04*
U.S. Cl. 62—133 **7 Claims**

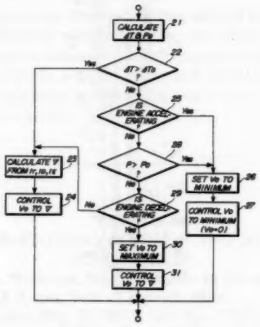
1. A method for controlling an air conditioning system for a vehicle, including a compressor of a variable delivery type disposed to be driven by an engine installed in said vehicle, for compressing refrigerant, a condenser for cooling said refrigerant compressed by said compressor into a liquefied state, an

expansion valve for regulating the flow rate of said liquefied refrigerant to a proper value corresponding to a thermal load on said air conditioning system, and an evaporator for evaporating said liquefied refrigerant supplied from said expansion valve, for cooling air to be discharged from said air conditioning system through heat exchange of said refrigerant being evaporated with said air, the method comprising the steps of:

(a) setting a first control manner of controlling the delivery quantity of said compressor in response to operating conditions of said engine, in a manner irrespective of thermal load conditions of said air conditioning system, for preferential achievement of required driveability of said engine;

(b) setting a second control manner of controlling the delivery quantity of said compressor in response to thermal load conditions of said air conditioning system, in a manner irrespective of operating conditions of said engine, for preferential achievement of required cooling capacity of said air conditioning system;

(c) selecting one of said first control manner and said second control manner; and



(d) controlling said air conditioning system in accordance with said selected one of said first and second control manners;

said first control manner comprising the steps of: (i) detecting operating conditions of said engine; (ii) controlling the delivery quantity of said compressor to a predetermined minimum value when said engine is in a first predetermined operating condition wherein a high engine output is required; (iii) controlling the delivery quantity of said compressor to a predetermined maximum value when said engine is in a second predetermined operating condition wherein a low engine output suffices; and (iv) calculating a value of the delivery quantity of said compressor appropriate to a third operating condition of said engine other than said first and second predetermined operating conditions and required for achieving a desired value of the temperature of a compartment in said vehicle and controlling the delivery quantity of said compressor to said calculated value in a manner gradually varying the delivery quantity of said compressor toward said calculated value, when said engine is in said third operation condition.

4,510,765

CONTROL UNIT FOR REFRIGERATORS OR FREEZERS

Guglielmo Rossi, Linkenheim, Fed. Rep. of Germany, assignor to Ranco Incorporated, Dublin, Ohio

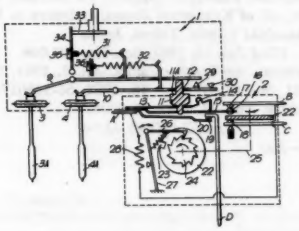
Filed Feb. 2, 1983, Ser. No. 463,118

Claims priority, application United Kingdom, Feb. 5, 1982, 8203377; Apr. 26, 1982, 8211974

Int. Cl.³ F25D *21/06*

U.S. Cl. 62—154 **16 Claims**

1. A control unit for a refrigerator or freezer of the type including an evaporator, a compressor having a drive motor, and an electrical defrost heater associated with the evaporator, the said control unit including a switch device having a first pair of contacts controlling the cyclic cutting-in and cutting-out of the compressor drive motor, wherein the switch device has a second pair of contacts and a movable contact common to the first and second pair of contacts, the second pair of contacts controlling the periodic energisation of the defrost heater, a stop member associated with the second pair of contacts and normally obstructing closure thereof, actuator means acting on the stop member, said actuator means being responsive to a predetermined number of switching cycles of the compressor motor to move the stop member to a defrost



position in which it permits movement of said movable contact to close the second pair of contacts and thereby energise the defrost heater, first operating means acting upon the common movable contact to open and close the first pair of contacts and to close the second pair of contacts, said first operating means being responsive to an ambient temperature in the apparatus, and second operating means for effecting movement of said movable contact in a sense to open the second pair of contacts to terminate energisation of the defrost heater, said second operating means being responsive to the evaporator temperature.

4,510,766

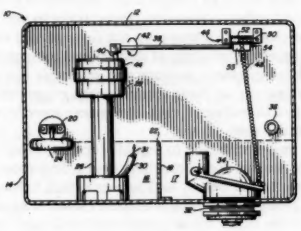
WATER EXCHANGER AND METHOD FOR EVAPORATIVE COOLER

Thad C. Curtis, Sr., 5820 S. Hopdown La., Tucson, Ariz. 85746

Filed Mar. 14, 1983, Ser. No. 474,840

Int. Cl.³ F28D *3/00*

U.S. Cl. 62—171 **13 Claims**



1. Water exchange apparatus for use with an evaporative cooler which comprises:

a water-tight tank having a bottom, said tank being divided into first and second portions;

means operably secured to said tank for controlling water height within said tank;

pump means operably secured to said tank for pumping water from said first portion of said tank to said evaporative cooler;

water return means operably coupled to said tank for returning water from said evaporative cooler to said tank;

drain means positioned on said bottom of said tank for draining water from said tank;

timing means for periodically actuating said drain means; and

damming means operably secured to said tank for dividing said tank into said first and second portions such that said pump means and said means for controlling water height are located in said first portion and said drain means and water return are located in said second portion.

4,510,767

COLD STORAGE AND REFRIGERATION SYSTEM

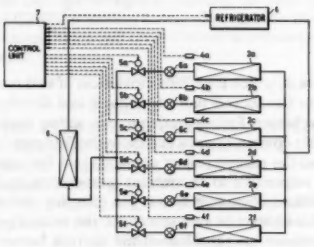
Fumiaki Komatsu; Kazuyuki Saegusa; Yu Seshimo, and Norio Yamashita, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1982, Ser. No. 401,046

Claims priority, application Japan, Jul. 3, 1981, 56-104645; Jul. 23, 1981, 56-115587; Aug. 10, 1981, 56-125017; Aug. 10, 1981, 56-125018; Apr. 23, 1982, 57-69061

Int. Cl.³ F25B *41/04*

U.S. Cl. 62—200 **4 Claims**



1. A cold storage and refrigeration system comprising:

a refrigerator;

a plurality of cold storage and refrigeration units divided into two groups, one relatively heavily loaded and the other relatively lightly loaded, and having evaporators, respectively, connected to said refrigerator for passage therethrough of a refrigerant when said refrigerator is in operation;

a plurality of temperature sensors installed respectively in said cold storage and refrigeration units for detecting first and second levels of temperature respectively therein;

a plurality of valves connected respectively to said evaporators and closable for stopping the flow of said refrigerant in response to a detection of said second temperature level by said temperature sensors and openable for allowing said refrigerant to flow through said evaporators in response to a detection of said first temperature level by said temperature sensors; and

a control unit responsive to signals supplied from said temperature sensors for controlling said refrigerator and said valves such that one of said valves which belongs to one of said groups and which is earliest closed is again opened if any of the other valves associated with said one of said groups is open when the cold storage and refrigeration unit coupled with said one of said valves has a temperature increased from below said second temperature level to higher than the latter; that any of said valves associated with said one of said groups and coupled with those cold storage and refrigeration units which have temperatures higher than said second temperature level is opened when any of said cold storage and refrigeration units in said one of said groups has a temperature which has become higher than a predetermined temperature level between said first and second temperature levels after having reached said second temperature level and when at least one of said valves remains open; and that said refrigerator is deenergized when all of said valves are closed; and all of said valves are opened and said refrigerator is energized when at least one of said valves is opened at said first temperature level.

4,510,768

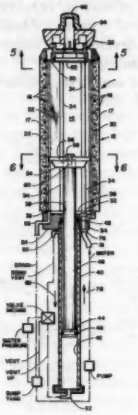
ADJUSTABLE ICE BREAKER FOR AN ICE MACHINE PRODUCING SHEET ICE

Paul Keller, 1004 94th Ave. NW., Coon Rapids, Minn. 55433

Filed Jun. 30, 1983, Ser. No. 509,322

Int. Cl.³ F25C *5/12*

U.S. Cl. 62—320 **13 Claims**



1. In a sheet ice making machine of the type having a dispensing end for dispensing sheet ice,

an improvement for enabling sheet ice pieces of any size within a range of sizes to be selectably produced, comprising:

ice breaker means spaced from said dispensing end, and

adjustment means for selectively adjusting the spatial distance of said ice breaker means to any of a plurality of different fixed postions from said dispensing end so as to be able to break said ice sheet dispensed by said dispensing end into chips of selectively variable size.

4,510,769

THERMALLY INSULATING DEVICE FOR A BEVERAGE-CONTAINING BOTTLE

Robert D. McClellan, Jr., 326 Olive Ave., Horsham, Pa. 19044

Filed Apr. 5, 1984, Ser. No. 597,073

Int. Cl.³ F25D *3/08*

U.S. Cl. 62—457 **6 Claims**

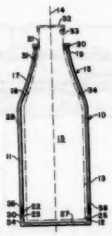
1. An adjustable container for maintaining a long-necked beverage containing bottle at a low temperature comprising:

(a) an upper member elongated about a center axis of symmetry and comprised of an outer shell of circular cross section in planes perpendicular to said axis and having interior and exterior surfaces, a layer of thermally insulative material of uniform thickness disposed upon said interior surface, an open upper extremity provided with an inwardly disposed resilient gasket of annular contour, and an open lower extremity of larger diameter than said upper extremity and provided with spiral threading, and

(b) a base member of cup-shaped structure comprised of an outer shell of circular cylindrical configuration having interior and exterior surfaces and having a lower extremity and an open upper extremity, a flat panel serving to close said lower extremity and having interior and exterior surfaces, a layer of thermally insulative material of

uniform thickness disposed upon said interior surfaces, and spiral threading disposed upon said outer shell adjacent its upper extremity and adapted to engage the complementary threading of said upper member whereby,

(c) when said base member threadably engages said upper



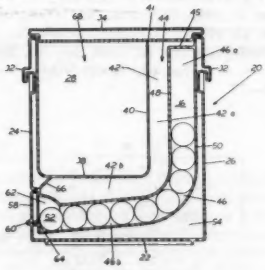
member about an intervening long-necked bottle, rotation of one member with respect to the other causes both members to be drawn into closer engagement, causing said gasket to firmly grip the bottle and thereby form a stagnant air envelope between the bottle and the thermally insulative material.

4,510,770

CHEST FOR STORING, COOLING AND DISPENSING COMESTIBLES

Paul L. Vella, Westland, Mich., assignor to Thomas K. Ziegler and David J. Lucas, both of Detroit, Mich.

Filed Mar. 25, 1983, Ser. No. 478,927
Int. Cl.³ F25D *3/02*
U.S. Cl. 62—464 **21 Claims**



1. An ice chest for storing and cooling comestibles, comprising:

an enclosure including two opposing sidewalls, a front wall, a rear wall and bottom;

a cover removably mounted on the top of said enclosure;

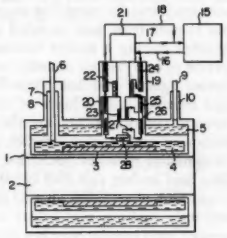
a downwardly extending chute within said enclosure, said chute being adapted to store and dispense a plurality of beverage containers and including an upper end and a lower end, said lower end having an opening and therein through which said containers are dispensed, said chute further including first and second portions disposed laterally in side-by-side relationship to each other and each defining an individual path along which a group of said containers may travel during dispensing thereof and a partition in said chute between said first and second portions thereof.

4,510,771

CRYOSTAT WITH REFRIGERATING MACHINE

Toshiharu Matsuda, Kudamatsu; Minoru Imamura, and Norihide Saho, both of Yamaguchi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 4, 1983, Ser. No. 520,515
Claims priority, application Japan, Aug. 16, 1982, 57-141113
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—514 R **9 Claims**



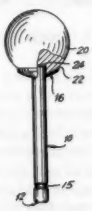
1. A cryostat with a refrigerating machine, comprising a first liquefied gas reservoir containing therein a first liquefied gas, a second liquefied gas reservoir containing therein a second liquefied gas, said second liquefied gas having a boiling point higher than that of the first liquiefied gas and said second liquefied gas reservoir being provided around the first liquefied gas reservoir, an outer wall adapted to surround the second liquefied gas reservoir through a vacuum space, said refrigerating machine including a heat exchanger and an expansion device and having a first section which is kept at a temperature higher that that of said second liquiefied gas reservoir, said first section being provided between the second liquefied gas reservoir and said outer wall; said refrigerating machine having a second section which is kept at a temperature lower than that of said second liquefied gas reservoir, said second section being provided between said first liquefied gas reservoir and said second liquefied gas reservoir, and said cryostat further comprising at least one condenser heat exchanger for recondensing the evaporated gas with a cooled coolant generated in the refrigerating machine, said at least one heat exchanger being provided at least in said first liquefied gas reservoir, and thermal contact means in contact with the refrigerating machine for cooling the second liquefied gas reservoir.

4,510,772

HOLLOW EARRING POST

Philip J. Alley, and Thomas R. Ireland, both of Warwick, R.I., assignors to Hallmark Findings, Inc., Warwick, R.I.

Filed Mar. 17, 1983, Ser. No. 476,051
Int. Cl.³ A44C *7/00*
U.S. Cl. 63—12 **8 Claims**



1. A metal post for a pierced earring produced by the steps of providing an elongated hollow, tubular member having a closed rounded end; providing a disk shaped member having

an upper face and a centrally positioned hole for receiving an end portion of said tubular member remote from said closed rounded end; coating said disk shaped member with a layer of solder flush on said upper face; positioning said remote end portion in said hole; and heating and subsequently melting said solder flush so that said disk shaped member is fastened thereby to said hollow tubular member.

5. A pierced earring produced by the steps of providing an elongated hollow, tubular member having a closed rounded end; providing a disk shaped member having an upper face and a centrally positioned hole for receiving an end portion of said tubular member remote from said rounded end; providing an ornamental member having a socket formed to receive said remote end portion of said tubular member with said ornamental member seating against said disk shaped member; coating said disk shaped member with a layer of solder flush on the face directed toward said ornamental member; positioning said remote end portion of said tubular member in said hole; positioning said ornamental member such that said remote end portion is within said socket and said ornamental member is seated against said face of said disk shaped member; and heating and subsequently melting said solder flush so that said ornamental member, said tubular member and said disk shaped member are secured to each other thereby.

4,510,773

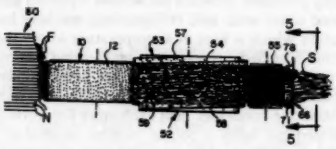
FIBER TRANSFER SYSTEM FOR SLIVER HIGH PILE FABRIC CIRCULAR KNITTING MACHINES

Earl R. Quay, and Alan L. Tilson, both of Orangeburg, S.C., assignors to Mayer, Rothkopf Industries, Inc., Orangeburg, S.C.

Continuation-in-part of Ser. No. 539,802, Oct. 7, 1983, abandoned. This application May 31, 1984, Ser. No. 615,801

Int. Cl.³ D01G *15/40, 15/84;* D04B *9/12*

U.S. Cl. 66—9 B **19 Claims**



1. A fiber transfer system for a sliver high pile fabric knitting machine, said system including a doffer, a main cylinder and sliver feeding elements, characterized by a doffer having an axial width less than the axial width of the main cylinder.

4,510,774

CONTROL DEVICE FOR A KNITTING MACHINE

Wolfgang Rose, Karl Marx Stadt, German Democratic Rep., assignor to VEB Kombinat Textima, German Democratic Rep.

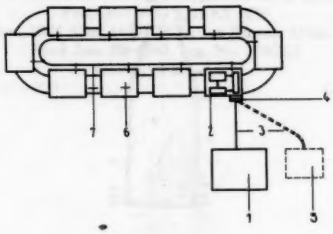
Filed Dec. 21, 1983, Ser. No. 564,227

Claims priority, application German Democratic Rep., Dec. 27, 1982, 246604

Int. Cl.³ D04B *7/00, 15/00*

U.S. Cl. 66—75.2 **1 Claim**

1. A control device for a knitting machine including stationary structural components and a plurality of carriages adapted to run in a knitting cycle over a predetermined path and provided with control elements for controlling functions of the carriages, the control device comprising a stationary control part and a movable control part movable together with at least one of said carriages, each of said control parts being provided with a microprocessor and data processing units, said stationary and movable control parts being both operated during the entire knitting process independently from each other, said stationary control part storing information data for the stationary structural components, said movable control part storing information data for pattern cords of at least one knitted piece; a first cable; a special laser, said first cable for connecting said movable control part with the laser and the stationary control part so that an application of the information data to the movable control part is effected from said laser and said stationary control part through said first cable; and a second cable connecting said movable control part to at least one of said carriages so that information data are transmitted from said movable control part to the control elements of said carriages for a selection of needles in accordance with required patterns and for changing functions of said carriages whereby an application of the information data to the movable control part can be effected selectively from said laser, or said stationary control part through said first cable.



4,510,775

FLAT KNITTING MACHINE CAPABLE OF CHANGING STITCH DENSITY

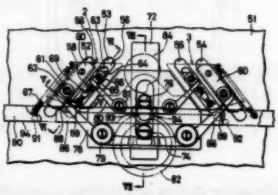
Masahiro Shima, Wakayamashi, Japan, assignor to Shima Idea Center Co., Ltd., Wakayama, Japan

PCT No. PCT/JP80/00233, § 371 Date May 27, 1982, § 102(e) Date May 27, 1982, PCT Pub. No. WO82/01199, PCT Pub. Date Apr. 15, 1982

PCT Filed Sep. 30, 1980, Ser. No. 385,375

Int. Cl.³ D04B *7/00*

U.S. Cl. 66—77 **20 Claims**



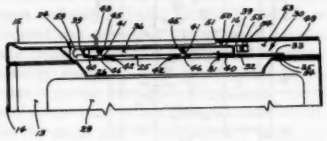
1. A flat knitting machine including a needle bed having a plurality of needle grooves therein, needles in the needle grooves, a carriage positioned over the needle bed for movement thereacross and engagement with selected needles on the needle bed to effect knitting of different size stitches and means for changing stitch size comprising selector means positioned on the needle bed for selecting predetermined needles in the needle grooves for movement to an upper and a lower position, means carried by the carriage and engageable with the selected needles for moving the selected needles to the upper or lower position, cam means engageable with the selected needles in the upper or lower position to effect knitting different size stiches therewith and means for adjusting the cam means to vary the size of the stitches effected by the selected needles engaged with the cam means.

4,510,776

SLIDING ACCESS DOOR FOR WASHING MACHINE

William J. McNally, and John C. Mellinger, both of Newton, Iowa, assignors to The Maytag Company, Newton, Iowa

Filed Dec. 27, 1983, Ser. No. 565,730
Int. Cl.[3] D06F *29/02, 39/14*
U.S. Cl. 68—3 R 6 Claims



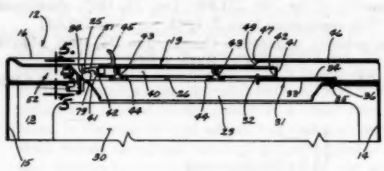
1. The combination including a top cover assembly for a washing machine and comprising: a horizontally disposed top cover associated with said washing machine and defining an access opening in said top cover for providing access to within said washing machine; means defining guideways at the sides of said access opening; access door means cooperable with said guideways for forward and rearward sliding movement to close said access opening in a first forward posture and to uncover said access opening in a second rearward posture; and panel means for limiting movement of said access door means and including a first portion fixed to said top cover generally below said access door means and at least partially restricting said access opening.

4,510,777

CONTROL SYSTEM FOR AN ACCESS DOOR

David I. Ellingson, and James D. Wilson, both of Newton, Iowa, assignors to The Maytag Company, Newton, Iowa

Filed Dec. 27, 1983, Ser. No. 565,734
Int. Cl.[3] D06F *33/02, 37/28*
U.S. Cl. 68—12 R 6 Claims



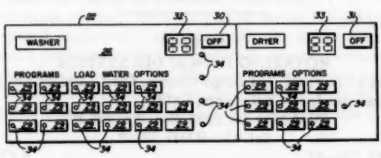
1. A washing machine including a control system for operation of said washing machine through a cycle of operations and for ensuring that an access door is closed and locked during predetermined portions of said cycle of operations and for ensuring that sensor switches associated therewith are properly operable, the combination comprising: cabinet means associated with said washing machine including a top cover defining an access into washing apparatus; an access door mounted on said top cover and movable between access-open and access-closed positions; circuit means including microcontroller-based program means for controlling said washing machine through said cycle of operations; latch means operable under control of said program means with said access door in the access-closed position for locking said access door in said access-closed position; switch means associated with said circuit means and actuatable from a first posture to a second posture by said latch means upon locking of said access door to provide a door-latched signal to said program means; and means for interrogating said switch means prior to said actuation and for receiving a verification signal with said switch means in said first posture to confirm the proper operability of said switch means upon receiving the door-latched signal, said program means being operable for verifying the second posture of said switch means throughout at least preselected portions of said cycle of operations whereby said circuit means is operable for interrupting operation of the washing machine upon detecting an inoperable switch means or an unlocked access door during said preselected portions.

4,510,778

CONTROL SYSTEM FOR A COMBINED APPLIANCE

Curran D. Cotton, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Dec. 27, 1983, Ser. No. 565,735
Int. Cl.[3] D06F *29/00, 33/02*
U.S. Cl. 68—12 R 9 Claims



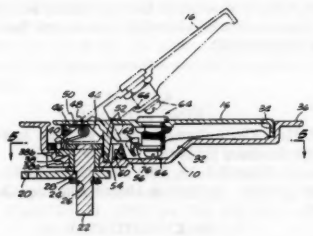
1. A control system for controlling the operation of a plurality of associated appliances, comprising: power supply means providing line current to each of said appliances; control panel means including selection means for inputting cycle information corresponding to each of said appliances and further including display means for each of said appliances; a single control means including microcontroller means in communication with said selection means and said power supply means and operable for controlling each of said appliances through independent cycles of operations; and low voltage interconnecting means between said control means and each of said appliances for carrying operational data signals from said control means to each of said appliances to effect selective and independent operation of one or concurrent and independent operation of more than one of said appliances.

4,510,779

AIRCRAFT DOOR LOCK ACTUATING MECHANISM

Munir J. Ahad, Valencia, Calif., assignor to Adams Rite Products, Inc., Glendale, Calif.

Filed Jul. 16, 1982, Ser. No. 399,056
Int. Cl.[3] E05B *13/10, 65/10*
U.S. Cl. 70—208 14 Claims



1. In a locking mechanism for an aircraft door having an outside actuating handle supported for movement between a normal flush position and a non-flush position, and an inside actuating handle, the improvement comprising:

means operable in response to the selective actuation of said outside handle and said inside handle for moving said locking mechanism into locked and unlocked positions;

manually releasable means operable to normally oppose movement of said outside handle from said flush position to a non-flush position;

means operable in response to a predetermined movement of

the inside actuating handle in an unlocking direction including:

a bolt actuating bell crank for moving said locking mechanism into an unlocked position; and

camming means for releasing said releasable means comprising a comming surface on said bell crank and a cam follower operatively associated with said releasable means; and

other means operable in response to said predetermined movement of the inside handle for moving the outside handle to a non-flush position in which it serves as a visual indicator that said door locking mechanism is in an unlocked position.

4,510,780

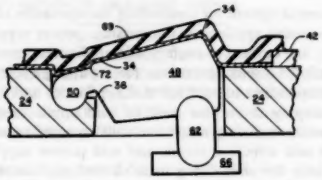
ROTATING PUNCH DIE SYSTEM

Gilbert C. Cadwell, San Diego County, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed May 16, 1983, Ser. No. 494,870

Int. Cl.³ B21D *39/08*

U.S. Cl. 72—57 **6 Claims**



1. A die for cold forming sheet metal comprising:

a male die member having metal forming surfaces a cylindrical end surface and a striker surface opposite one of said metal forming surfaces, said striker surface includes a curvilinear indentation;

a female die member with a central aperture therethrough and a curvilinear socket adjacent thereto, said socket receiving and securing said cylinder end surface of said male die member therein; and

resilient diaphragm means overlying the female die member for holding said sheet metal to be formed in position on the surface of said female die adjacent said forming surfaces of said male die member, whereby said male die member pivots about said cylindrical end surface within said aperture when impacted in the curvilinear indention on the striking surface by a driving force means thereby forming said sheet metal.

4,510,781

RING ROLLING

Peter J. Holt, Cheltenham, England, assignor to Formflo Limited, Cheltenham, England

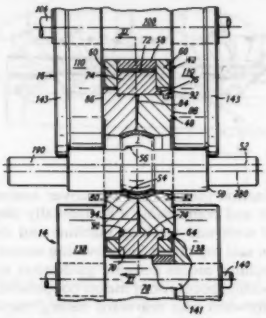
Filed Jul. 25, 1983, Ser. No. 517,025

Claims priority, application United Kingdom, Jul. 31, 1982, 8222149

Int. Cl.³ B21D *15/04*

U.S. Cl. 72—105 **17 Claims**

1. Apparatus for forming rings to a predetermined profile from a succession of annular blanks by cold rolling the blank, the apparatus being of the kind having an annular die, a mandrel for cooperating with the annular die, die drive means for rotating the die about the axis of the die, and force-applying means for applying a radial force to the mandrel when the mandrel extends through the die with the annular blank surrounding the mandrel and surrounded by the die, so as to squeeze the blank along an axial cross-section thereof to one side of the axis of the blank but not the other, said mandrel, die drive means and force-applying means being situated at, and defining, a working station of the apparatus, the apparatus comprising means for rotating the mandrel whereby the said radial force causes the section of the blank so squeezed to be deformed to conform with an internal profile of the die and an external profile of the mandrel, the apparatus further comprising means defining at least one transfer station remote from the working station, for removal of the rolled ring and insertion of



a fresh blank, and a shuttle having a through opening for accommodating the die, means for moving the shuttle so as to transfer the through opening between the working station and said at least one transfer station, the shuttle comprising means for so mounting the die as to cause the die drive means to be in operative engagement with the die when the latter is at the working station.

4,510,782

TORSION COILER

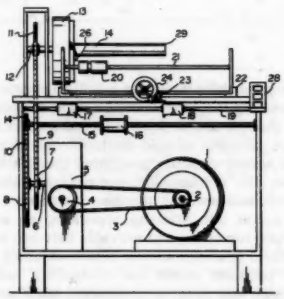
Alfred Risi, 117 East Ave., Brantford, Ontario, Canada N3S 1M1

Continuation of Ser. No. 221,809, Dec. 31, 1980, abandoned. This application Nov. 2, 1983, Ser. No. 548,037

Claims priority, application Canada, Jun. 24, 1980, 354674

Int. Cl.³ B21F *3/04*

U.S. Cl. 72—142 **4 Claims**



1. An apparatus for producing from high carbon spring steel feedstock helically coiled torsion springs of the type having leg members at predetermined radial positions with respect to the longitudinal axis of the springs, said apparatus comprising in combination:

a chuck including a cylindrical mandrel mounted in a lathe for rotational movement;

pick-up pin means positioned on the face of said chuck at a predetermined radial dimension relative to the elongated axis of said mandrel for holding a portion of said stock in a fixed position during rotation of said chuck and for

establishing an initial feed point of said stock adjacent said mandrel;

feed guide means for guiding said stock to said mandrel during rotation of said mandrel and for establishing successive stock feed points adjacent said mandrel along the longitudinal axis thereof, said successive stock feed points corresponding to successive convolutions of said stock around said mandrel, said guide means including spool means defining a guide groove in which said stock is accepted and advanced towards said mandrel, and carriage means disposed adjacent said mandrel, means for slideably mounting said spool means on said carriage means to permit unrestrained rectilinear movement of said spool means thereon in a direction substantially parallel to said elongated axis of said mandrel while yet permitting said mandrel to freely rotate to permit feeding of said stock towards said mandrel and to permit rectilinear feeding movement of said feedstock in a direction substantially parallel to said elongated axis so that successive stock feed points are established for each successive convolution of said feedstock around said mandrel during rotation of said chuck;

drive means operatively connected to said chuck for rotating said chuck;

control means operatively connected to said drive means for establishing the periods in which said chuck is permitted to rotate thereby establishing the axial length of said spring coiled around said mandrel and the radial positions of said leg members, said control means including first switch means for establishing said initial stock feed point and for stopping said drive means when said first switch means is activated, and second switch means for establishing the end of said coiled spring and for stopping said drive means when said second switch means is activated, means mounting said first and second switch means for movable positioning along an axis substantially parallel to said elongated axis of said mandrel for permitting said first and second switch means to be positioned relative to one another to define an axial space therebetween; and

switch activation means operatively connected to said drive means and disposed in said axial space for movement between said first and second switch means, said switch activation means being movable between said first switch means and second switch means at a linear rate proportional to the rate of axial advance of said successive feedstock points along said mandrel for permitting coiling of said feedstock around said mandrel when said activation means is traversing said axial space and for activating said first or second switch means to stop rotation of said drive means and thus to responsively stop coiling of said feedstock around said mandrel; whereby

said leg members of said coiled spring can be formed while said chuck is stopped and thereby said positioning of said first and second switch means relative to one another not only establishes the axial length of said coiled spring but also the radial positions of said leg members.

4,510,783

CHANGING ROLLS IN SIX-HIGH ROLL STAND

Hans Römmen, Dormangen, and Hans Frosch, Neuss, both of Fed. Rep. of Germany, assignors to SMS-Schloemann Siemag AG, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 28, 1983, Ser. No. 555,458

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244200

Int. Cl.[3] B21B-*28/00, 31/10*

U.S. Cl. 72—200 **11 Claims**

1. An apparatus for changing the rolls of a six-high roll stand having:

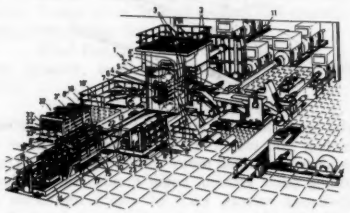
a frame,

a pair of vertically spaced nip-defining working rolls journaled in the frame for rotation about respective working-roll axes and having axially spaced working-roll journal blocks,

respective upper and lower inner backup rolls normally bearing respectively down and up toward the nip on the respective working rolls and journaled in the frame for rotation about respective backup-roll axes and having axially spaced backup-roll journal blocks, and

respective upper and lower outer backup rolls bearing toward the nip on the respective inner backup rolls and journaled in the frame for rotation about respective backup-roll axes and having axially spaced backup-roll journal blocks, the axes all normally lying in a common vertical plane, the changing apparatus comprising:

a changing carriage having a pair of similar full-set holders spaced horizontally and perpendicular to the plane and each provided with two vertically spaced working-roll supports and two vertically spaced backup-roll supports flanking the respective working-roll supports, the supports being vertically spaced like the respective rolls in



the stand, whereby a full set of two working and two backup rolls can be held in either of the holders;

means for displacing the changing carriage between upstream and downstream positions in each of which a respective one of the holders is axially aligned with the rolls in the stand;

a loading carriage having a working-roll holder provided with two vertically spaced working-roll supports and a backup-roll holder provided with two vertically spaced backup-roll supports, the carriage being displaceable into a position with the working-roll supports of the working-roll holder aligned with the working-roll supports of one of the full-set holders and a position with the backup-roll supports of the backup-roll holder aligned with the backup-roll supports of the one full-set holder; and

means for axially shifting rolls from the holders of the loading carriage into the one full-set holder, for axially shifting rolls from the stand into the other full-set holder, and for axially shifting the rolls in the one full-set holder into the roll stand.

4,510,784

ROLLING MILL SPRAY BAR

Yu-Wen Hsu, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Oct. 11, 1983, Ser. No. 540,964

Int. Cl.[3] B21B *27/10, 45/02*

U.S. Cl. 72—201 **5 Claims**

1. In a rolling mill having rolls for use in the reduction in thickness of a metal workpiece an improved device for applying liquid to a roll and/or the workpiece comprising

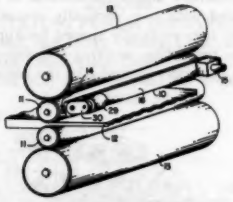
(a) an elongated housing provided with a plurality of nozzles for spraying liquid onto a roll and/or the workpiece and having conduits disposed in open fluid communication with the nozzles for directing liquid thereto;

(b) an elongated manifold rotatably mounted within the housing and having an arcuate wall which is provided with a plurality of apertures disposed in a predetermined array, said wall defining at least in part an interior chamber for containing liquid;

(c) sealing means arranged between the conduits disposed in open liquid communication with the nozzles and the outer surface of the arcuate wall of the manifold and providing sealed liquid passageways to the said conduits from the interior of the manifold;

(d) means for directing liquid to the interior chamber of the manifold;

(e) means for effecting the controlled rotation of the manifold within the housing to selectively align certain apertures in the arcuate wall of the manifold with selected conduits in open fluid communication with the nozzles so that liquid can be sprayed from the nozzles onto the rolls and/or the workpiece in a predetermined pattern;



(f) said manifold rotation means including motor means for rotating said manifold and a controlling panel element associated with said motor means and manifold, said controlling panel element being divided into a plurality of pie-shaped sectors, each of which represents a given width of liquid spray, and said sectors being further subdivided into subsections which represent particular combinations of opened and closed nozzles which provide a selected spray width pattern; and

(g) means associated with said panel element and motor means for selecting a given controlling panel element sector and thereby effecting a corresponding rotation of the motor means and manifold as determined by the panel element sector selected.

4,510,785

AUTOMATIC SHEET METAL FOLDING MACHINE

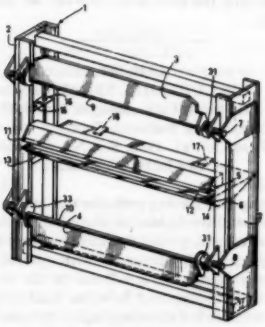
Jean Triouleyre, Meriel; Jean Rousselin, Jouy en Josas; Patrick Schmit, Bouzonville, and Philippe Gondry, Saint Quentin, all of France, assignors to Ets. Y. Jouanel S.A., Gentilly, France

Filed Jul. 6, 1982, Ser. No. 395,833

Claims priority, application France, Jul. 7, 1981, 81 13349

Int. Cl.³ B21D *5/04*

U.S. Cl. 72—323 **15 Claims**



1. An automatic sheet metal folding machine comprising a fixed frame, two gripping members aligned in one direction relative to said frame for clamping a metal sheet to be folded and having parallel working edges and parallel gripping surfaces with said gripping surfaces extending perpendicular to said one direction, each of said folding members including a folding tool having a surface defining a work plane on said folding machine, means for positioning the desired folding lines of a metal sheet with respect to the working edge of a gripping member, drive means able to move said gripping members for clamping a metal sheet to move said gripping members together with a clamped metal sheet as a unit with respect to said frame successively in said one direction towards each different one of said folding members, means for fixedly supporting the pivots of said folding members during folding operations, and means for adjusting the position of said pivots by small magnitude movements.

4,510,786

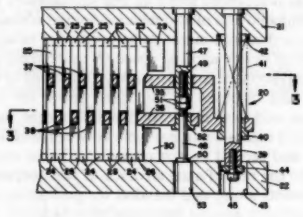
METHOD AND APPARATUS OF MAKING DOUBLE REVERSE CORRUGATED MATERIAL

William J. Strangward, Rocky River, Ohio, assignor to The Langenau Manufacturing Company, Cleveland, Ohio

Filed May 19, 1983, Ser. No. 496,088

Int. Cl.³ B21D *28/10, 45/08*

U.S. Cl. 72—326 **10 Claims**



1. A method of making double reverse corrugated material which comprises the steps of:

(a) feeding sheet metal material between two opposed dies, each die having laterally spaced projections, the projections on one of the dies being opposite the space between the projections on the other of the dies, each of the dies also having a stripper positioned in the spaces between the projections of the die;

(b) moving one die toward the other die to form the corrugations in the double reverse corrugated material;

(c) moving one die away from the other die while maintaining said other die and both strippers substantially fixed with respect to each other;

(d) moving the stripper associated with said one die with respect to said other die;

(e) after step (d) and after the formed doubled reverse corrugated material has been stripped from said one die and before the double reverse corrugated material has been stripped from said other die, moving the stripper associated with said other die with respect to said other die to strip the formed double reverse corrugated material from said other die; and

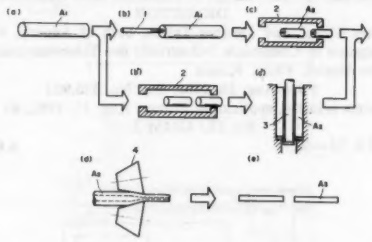
(f) moving the formed material out from between the dies.

4,510,787

METHOD OF MANUFACTURING HOLLOW RODS

Chihiro Hayashi, and Kazuyuki Nakasuji, both of Amagasaki, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 28, 1983, Ser. No. 508,718
Claims priority, application Japan, Jun. 30, 1982, 57-114363; Apr. 22, 1983, 58-71739
Int. Cl.³ B21B 27/02, 19/04
U.S. Cl. 72—368 12 Claims



1. A method for manufacturing hollow rods, comprising:

a piercing step in which a round billet is pierced into a hollow piece by machining or plastic working, and an elongating step in which the hollow piece is reduced in both outside diameter and wall thickness in order to obtain the desired dimensional values so that it is turned into a hollow rod having a wall thickness to diameter ratio of 25% or above,

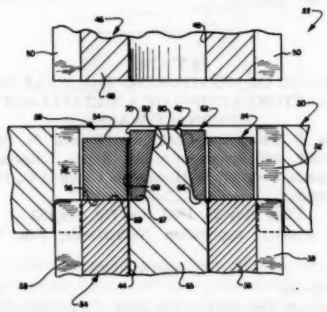
said elongating step being carried out by means of a rotary mill having three or four cone-type rolls arranged around a pass line for the hollow piece being worked and without any internal sizing tool, said rolls being such that their diameters may be varied straightly along the axes thereof, said rotary mill being of such cross-roll type that the axes of the rolls are inclined or inclinable by a cross angle γ so that the shaft ends on either side of the rolls stay close to or stay away from the pass line, the axes of the rolls being inclined by a feed angle β so that the shaft ends on the respective sides of the rolls face in the peripheral direction on the one and same side of the hollow piece being worked.

4,510,788

METHOD OF FORGING A WORKPIECE

Blake L. Ferguson, Broadview Heights, and Donald J. Moracz, Garfield Heights, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Jun. 21, 1983, Ser. No. 506,305
Int. Cl.³ B21D 53/28, 31/00
U.S. Cl. 72—377 5 Claims



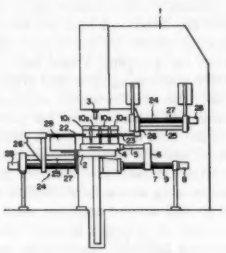
1. A method of forging a metal workpiece in a press having a working chamber partially defined by a side wall which extends around a removable center section which is hollow, said method comprising the steps of placing the workpiece in the chamber, telescoping the center section over a support member, thereafter, applying force against opposite sides of the workpiece to press the metal of the workpiece against the side wall of the chamber and against the outer side surface of the center section, supporting the center section with the support member during the application of force against opposite sides of the workpiece, removing the workpiece and center section from the chamber with the workpiece gripping the center section, and, thereafter, separating the center section from the workpiece.

4,510,789

PRESS BRAKE

Kunio Tomioka, Kawasaki; Shigeru Tokai, Komatsu, and Tatsuo Tsuchida, Tokyo, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 10, 1982, Ser. No. 448,604
Claims priority, application Japan, Dec. 16, 1981, 56-186219[U]
Int. Cl.³ B21D 5/02, 43/26
U.S. Cl. 72—442 3 Claims



1. A press brake adapted to apply bending on metal blanks in the form of a sheet or plate comprising:

a bed extending along a longitudinal direction in a horizontal plane;

a vertically movable ram mounted on a body of the press brake oppositely to the bed;

a die holder mounted on the bed so as to be reciprocatingly movable in the direction perpendicular to a longitudinal direction of the bed;

a plurality of die assemblies separate from said die holder and located on said die holder at intervals of a predetermined distance in the direction perpendicular to the longitudinal direction of the bed, each die assembly being provided with an upper die and a lower die which are associated with each other and held correspondingly while leaving a predetermined space and can be moved vertically towards and away from each other, each said die assembly further comprising a die shoe for supporting said upper die with each shoe being separate from the other shoes and wherein each upper die and associated lower die is provided with opposed working faces within said space; and

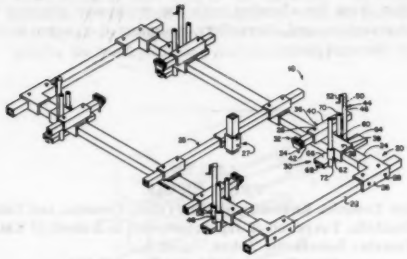
a front stopper and an inside stopper located on opposite sides of the press brake body, and means for moving said front stopper and inside stopper freely towards and away from each other so as to pass through the spaces between the upper dies and the lower dies, said front stopper and inside stopper being movable across the entire working faces of at least one die assembly within said space.

4,510,790

BODY AND FRAME STRAIGHTENING SYSTEM

Charles E. Hare, 23 Franklin Valley Cir., Baltimore, Md. 21136

Continuation-in-part of Ser. No. 286,086, Jul. 23, 1981, Pat. No. 4,404,838. This application Aug. 26, 1982, Ser. No. 411,660
The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.
Int. Cl.³ B21D 1/12
U.S. Cl. 72—457 1 Claim



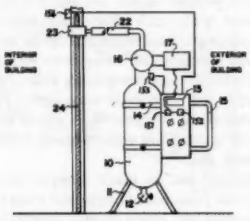
1. In a system for body and frame straightening, having: a plurality of rails, means for adjustably assembling said plurality of rails as a rectangular frame, a plurality of jacking means for carrying and raising and lowering said plurality of rails, a base on each jacking means, a first member on each jacking means, each first member mounted on a said rail and permitting positioning each jacking means by movement along said rail, a plurality of means for gripping a said body, and means for permitting laterally positioning each said gripping means laterally of a said rail, the improvement comprising: means for requiring movement of a said means for permitting laterally positioning, upon any said movement of a jacking means along a said rail; each means for requiring movement including: a second member fixed on each first member transverse to said rail and each said jacking means base fixed to a respective first member parallel to said second member, each means for gripping including a pair of grippers laterally aligned, and each means for permitting laterally positioning including an arm slidably mounted in said second member and having an upright flange thereon mounting said pair of grippers.

4,510,791

METHOD AND APPARATUS FOR TESTING THE AIR-TIGHTNESS OF A BUILDING USING TRANSIENT PRESSURIZATION

Grenville K. Yuill, Winnipeg, Canada, assignor to Lion Industries Ltd., Winnipeg, Canada

Continuation-in-part of Ser. No. 414,449, Sep. 2, 1982, abandoned. This application May 14, 1984, Ser. No. 610,036
Claims priority, application United Kingdom, Sep. 3, 1981, 8126658
Int. Cl.³ G01M 3/26
U.S. Cl. 73—40 16 Claims



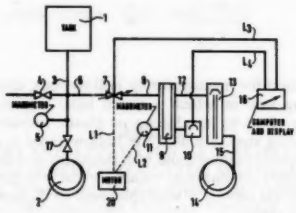
1. A method for use in the determination of the air-tightness of a structure comprising introducing into the structure gas at a rapid rate and for a short period of time so as to create in the air pressure within the structure a pressure pulse defining a profile which rapidly rises from an ambient pressure within the structure to a peak and then declines back to the ambient pressure without reaching a steady state, and detecting information concerning the profile of the pulse.

4,510,792

APPARATUS FOR MEASURING AND DISPLAYING LEAKAGE RATES IN A TRACER GAS LEAKAGE DETECTOR

Jacques Morel, and Jacques Tallon, both of Annecy, France, assignors to Compagnie Industrielle des Telecommunications Cita-Alcatel, Paris, France

Filed Aug. 24, 1983, Ser. No. 525,902
Claims priority, application France, Aug. 27, 1982, 82 14699
Int. Cl.³ G01M 3/22
U.S. Cl. 73—40.7 4 Claims



1. Apparatus for measuring and displaying leakage flow rate Q in a tracer gas leakage detector of the type mainly comprising a primary vacuum pump which is selectably connectable to a unit to be tested for leakage, an inlet valve also connectable to said unit to be tested and communicating with a measurement cell capable of being evacuated by pumping means including a primary pump and a secondary pump, said inlet valve including a motor-driven, displaceable valve member forming a variable size valve aperture, means for controlling said motor to vary the position of said valve member to change the aperture size of the inlet valve correlated to the inlet pressure of said measurement cell, and conversion means providing an electrical signal representative of said aperture size, the improvement wherein said apparatus for measuring and displaying the leakage flow rate is connected to receive said aperture size-representing electrical signal and includes a display system for displaying, as a function of said aperture size-representing electrical signal, a valid sub-range of n decades of possible valid measurements taken from a total measuring range of N decades for the apparatus as a whole, thereby warning users that any indicated leakage flow rate values outside said valid sub-range are spurious.

4,510,793

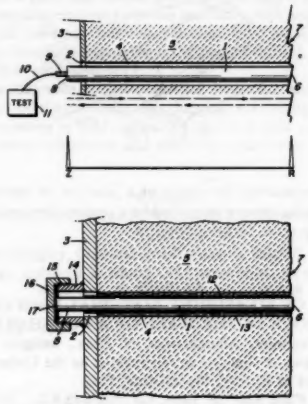
METHOD OF MONITORING THE WEAR OF A REFRACTORY LINING OF A METALLURGICAL FURNACE WALL

Hendrikus T. Ploegaert, Castricum; Ronald N. Molenaar, Heemskerk, and Johannes A. M. Butter, Uitgeest, all of Netherlands, assignors to Hoogovens Groep B.V., IJmuiden, Netherlands

Filed May 25, 1983, Ser. No. 498,152
Claims priority, application Netherlands, Jun. 3, 1982, 8202239
Int. Cl.³ G01N 29/04
U.S. Cl. 73—86 7 Claims

1. A method of monitoring the wear of a refractory lining of a metallurgical furnace wall during use of the furnace, comprising the steps of:

(1) arranging a bar of ceramic material in said wall so that the bar has an inner end at the inner face of the lining and extends to the exterior of the wall, the bar thus being subjected to wear at its inner end as the lining wears and



(2) determining the position of the worn inner end of the bar ultrasonically by generating ultrasonic pulses in the bar and detecting the reflection of said pulses from the worn inner end of the bar.

4,510,794

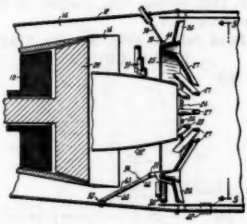
AFTERBURNER FLAMEHOLDER ION PROBE

Robert P. Couch, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1982, Ser. No. 454,116

Int. Cl.³ G01M *15/00*; F23N *5/24*

U.S. Cl. 73—116 **3 Claims**



1. An ion/electrostatic probe for an afterburning gas turbine jet engine comprising a conductive flameholder totally electrically insulated from other engine parts and an electrical connection from said flameholder to a point external to the engine case.

4,510,795

METHOD FOR MEASURING AIR FLOW

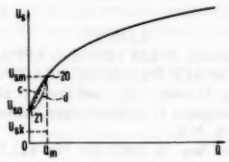
Jaihind S. Sumal, Vaihingen-Ensingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 417,977

Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218930

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—118 **4 Claims**



1. A method for measuring the air flow of the air aspirated by an internal combustion engine in a flow cross section by means of an air flow measuring device which has a characteristic curve determined by the association of an air flow value Q with an air flow measurement value U_s of the air flow measuring device, and for the purpose of correction of the air flow measurement value U_s in the case of a pulsating flow, comprising the steps of, establishing a selected range of the characteristic curve of the air flow measuring device located below a minimum air flow measurement value (U_{sm}) corresponding to a minimum flowthrough value (Q_m) and extending from an air flow value of zero, having an air flow measurement value (U_{so}), as far as the minimum flowthrough value (Q_m), and modifying the air flow measurement value (U_s) within the selected range defined in the previous step, whereby an error in the air flow measurement value (U_s) resulting from the pulsating flow is reduced.

4,510,796

METHOD FOR MOUNTING AT LEAST ONE SINGLE-CYLINDER PLUG-IN FUEL INJECTION PUMP ON A DIESEL INTERNAL COMBUSTION ENGINE

Günter Kampichler, Mühlacker, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

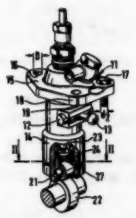
Division of Ser. No. 417,738, Sep. 13, 1982, Pat. No. 4,455,868.

This application Feb. 23, 1984, Ser. No. 582,690

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210988

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 A **5 Claims**



1. A plug-in fuel injection pump for use in an internal combustion engine, said engine provided with a pump fitting in which said injection pump is to be placed and said injection pump comprises a body portion, said body portion including a supply quantity adjusting member, a coupling element associated with said supply quantity adjusting member cooperative with an engine governor rod in said engine, said engine gover-

nor rod being provided with a mating element, a first reference indication on said body portion of said pump for indicating an adjusted rotary position of said pump and a second positional alignment reference indication on the pump fitting in said engine for aligning said injection pump in said pump fitting of said engine, said coupling element engaging said mating element of said engine governor rod, said supply quantity adjusting member engages said coupling element cooperative with said governor rod and a limiting stop for adjusting the engine governor rod.

4,510,797

FULL-BORE DRILL STEM TESTING APPARATUS WITH SURFACE PRESSURE READOUT

Shelby L. Guidry, Houston, Tex., and Perry J. DeCuir, Sr., New Iberia, La., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 23, 1982, Ser. No. 422,246
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—151 **26 Claims**

1. Apparatus adapted for use in well testing comprising:
a tubular housing having an open bore therethrough;
a downwardly facing recess in the wall of said housing laterally offset from and opening into said open bore;
a first electrical contact mounted in said recess; and
guide means below said recess for guiding a second electrical contact carried by an associated running tool upwardly through said opening into said recess and into engagement with said first electrical contact.

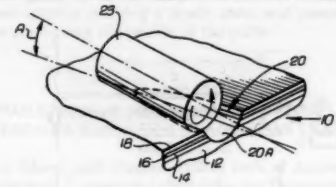
4,510,798

SHALLOW JUNCTION DEPTH MEASUREMENT METHOD

Simon A. Prussin, Los Angeles, and Boris L. Hikin, Playa del Ray, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 20, 1982, Ser. No. 451,373
Int. Cl.³ G01B *11/02*
U.S. Cl. 73—150 R **11 Claims**

1. A method for determination of depths of junctions between successive layers in an integrated circuit wafer, said method comprising the steps of:
forming in the surface of the wafer a groove that is tapered in depth and width whereby each interlayer junction appears as a part-elliptical line having a peak at the center of the groove indicative of the perpendicular junction depth; and



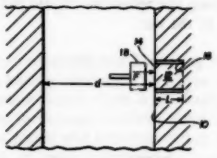
directly measuring the depth of a junction of interest at a point in the groove identified by a peak in the junction line on the groove surface.

4,510,799

METHOD OF MEASURING MATERIAL PROPERTIES OF ROCK IN THE WALL OF A BOREHOLE

David K. Overmier, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 26, 1983, Ser. No. 488,826
Int. Cl.³ E21B *49/02*; G01N *33/24, 3/02*
U.S. Cl. 73—151 **8 Claims**



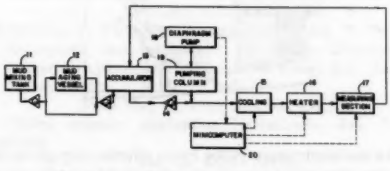
1. An in-situ method of measuring elastic properties of rock surrounding a borehole, comprising the steps of cutting into a wall of the borehole along a closed path to form a plug having an exposed top surface and a base that is integral with underlying rock; applying a force to the plug; measuring resultant deformation of the plug within the elastic range of the rock and combining the applied force and resultant plug deformation to obtain a measurement of the mechanical property.

4,510,800

DRILLING MUD TESTING SYSTEM HAVING A THERMALLY ISOLATED PUMP

Maurice Prior, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,565
Int. Cl.³ G01N *25/00*
U.S. Cl. 73—153 **10 Claims**



1. A system for testing drilling mud comprising:
measuring means for testing the parameters of said drilling mud;

means for heating said drilling mud to an elevated temperature; and

means for pumping heated drilling mud through a flow path to said measuring means including:

a pump which successively withdraws mud from said flow path and discharges mud into said flow path;

a pumping column between said flow path and said pump, said column containing drilling mud which thermally isolates said pump from the heated drilling mud in said flow path; and

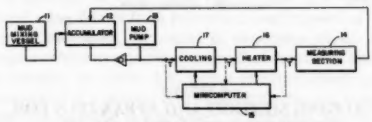
a heat exchanger between said flow path and said pump for cooling drilling mud therein, said drilling mud reciprocating in said pumping column as said pump successively withdraws and discharges said mud.

4,510,801

CONTROLLED HEATER FOR DRILLING MUD TESTING SYSTEM

M. Scott Quigley, Garland, and Gordon A. Russell, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,568
Int. Cl.³ G01N *25/00*
U.S. Cl. 73—153 **6 Claims**



1. A temperature control apparatus for a system for testing drilling mud comprising:

means for measuring the parameters of said drilling mud

means for pumping said drilling mud in a recirculating path through said means for measuring;

a mud heater in said recirculating path;

cooling means connected in front of said heater in said recirculating path; and

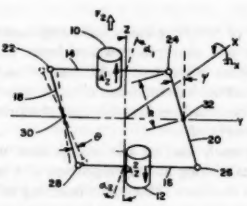
means for controlling said heater and said cooling means to maintain a constant temperature differential across said heater.

4,510,802

ANGULAR RATE SENSOR UTILIZING TWO VIBRATING ACCELEROMETERS SECURED TO A PARALLELOGRAM LINKAGE

Rex B. Peters, Woodinville, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Sep. 2, 1983, Ser. No. 528,774
Int. Cl.³ G01C *19/56, 23/00;* G01P *15/08*
U.S. Cl. 73—505 **28 Claims**



1. An apparatus for generating a signal representing the angular rate motion of a structure comprising:

a first accelerometer having a first force sensing axis;

a second accelerometer having a second force sensing axis;

a parallelogram mechanism including a first accelerometer support member secured to said first accelerometer, a second accelerometer support member secured to said second accelerometer and a linkage mechanism attached to said first and said second accelerometer support members and secured to the structure such that said first and said second force sensing axes are aligned in parallel;

drive means operatively connected to said parallelogram mechanism for vibrating said first and second accelerometer support members in a direction substantially normal to said first and second force sensing axes at a frequency ω; and

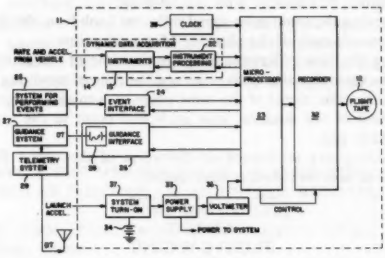
signal processing means operatively connected to said first and second accelerometers for generating a rate signal representing the angular rate motion of the structure.

4,510,803

FLIGHT RECORDER HAVING CAPABILITY OF STORING INTERMEDIATE DATA

Thomas E. Perara, Union, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 27, 1982, Ser. No. 453,554
Int. Cl.³ G06F *15/50*
U.S. Cl. 73—178 R **13 Claims**



1. Test equipment for a unit under test characterized by:

(a) means for transmitting a discrete telemetry signal associated with the units;

(b) a first component, associated with the unit, for sensing a plurality of conditions, the first component including:

(i) a clock for providing a timing signal,

(ii) a plurality of sensors for providing signals in response to predetermined conditions of the unit under test, and

(iii) memory means for storing the signals in coordination with the timing signal;

(iv) means for supplying an indication of the discrete telemetry signal to the memory means;

(c) tracking means for receiving the discrete telemetry signal and for measuring a real time difference between the transmission of the discrete telemetry signal and a separate event observed to occur with the unit under test;

(d) a second component remotely disposed from the first component for receiving the data from the memory means and for providing an indication of the conditions sensed by the first component, the second component including:

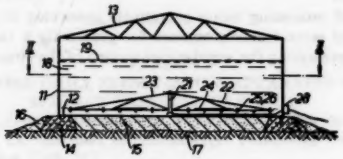
(i) means for receiving said real time measurement, and

(ii) means for correlating the real time measurement with the information stored in the memory means in order to provide an output relating to the unit under test.

4,510,804
DISTANCE MEASURING

Dennis W. G. Byatt, Great Baddow, and John W. Walker, Danbury, both of England, assignors to The Marconi Co. Ltd., Chelmsford and Occidental Refineries Ltd., London, both of, England

Filed Sep. 30, 1982, Ser. No. 432,401
Int. Cl.³ G01N *23/28*
U.S. Cl. 73—290 V **16 Claims**



1. A method of detecting the settlement or distortion of the floor of a liquid-containing vessel, which method is particularly applicable to detecting or measuring baseplate distortion in soil-supported oil storage tanks of the type wherein the peripheral areas only of the tank are supported upon a rigid base, in which method there is employed a sonic echo sounding procedure utilizing sound transmitting and receiving transducer means, said method comprising the steps of:

transmitting a sonic signal towards the vessel floor from each of a plurality of spaced points which are disposed beneath the surface of the liquid at generally-preselected locations within the vessel above the vessel floor and in known relationship with one another;

receiving the sonic echo signal reflected back from the floor beneath each of the plurality of spaced points;

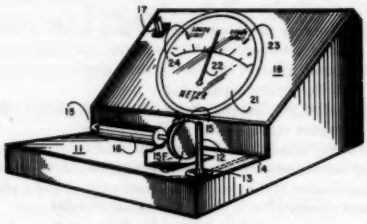
using the time difference between the time of transmitting the sonic signal at each point and the time of receiving the sonic echo signal at the same point to furnish a measurement of the distance from each said point to the vessel floor; and,

detecting any settlement or distortion of the vessel floor from said furnished measurements.

4,510,805
FLUID GAUGING

John D. Saint-Amour, 158 E. Main St., Westborough, Mass. 01581

Filed Sep. 21, 1983, Ser. No. 534,495
Int. Cl.³ G01B *13/10*
U.S. Cl. 73—37.9 **6 Claims**



1. Fluid gauging apparatus comprising,

pin means for receiving a hollow item whose cross sectional area is to be measured,

reference valve means for developing a hydraulic impedance representative of a predetermined reference cross sectional area for a hollow item to be tested,

a source of fluid pressure,

means including test conduit means for coupling said fluid under pressure from said source to said pin means to develop fluid flow along the axis of said pin means between said pin means and a hollow item when seated thereon characterized by a hydraulic impedance representative of the inside cross sectional area of the hollow item then seated on said pin means,

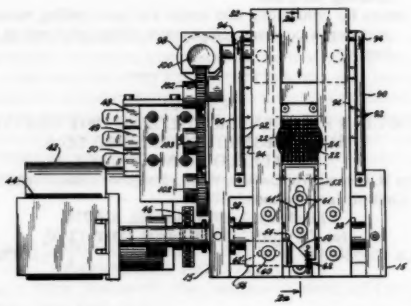
indicating means responsive to a predetermined parameter differential between said test conduit and said reference conduit for providing an indication of the deviation of the cross sectional area of the hollow item then seated on said pin means relative to said reference value,

and pressing means for urging one side of the hollow item against said pin means to establish a fluid passage between said pin means and the hollow item seated on said pin means for at least nearly the entire length of said passage so that said parameter differential is accurately representative of the difference between the inside cross sectional area of said hollow item and said reference cross sectional area.

4,510,806
GAUGING METHOD AND APPARATUS FOR COMPONENTS HAVING LEADS

Stanley W. Janisiewicz, Endwell, and Emery L. Rose, Chenango Bridge, both of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Apr. 27, 1983, Ser. No. 489,203
Int. Cl.³ G01R *31/26*
U.S. Cl. 73—432 R **33 Claims**



1. A method of handling electrical components of the type having a body and multiple rows of leads protruding out through one surface of said body with each of said leads defineable by a longitudinal axis intended to be substantially perpendicular to said one surface; said method comprising the steps for each component of:

straightening each lead of said component which is bent from said axis along at least a portion of a length thereof in order to facilitate subsequent handling of said component;

testing electrical functioning of said component, during said straightening, in order to determine said subsequent handling; and

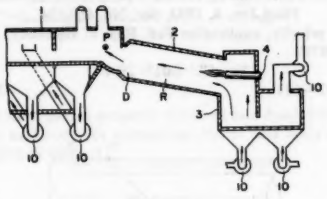
controlling said handling of electrical components according to an automated controller in order to effect said straightening and testing.

4,510,807

DIAGNOSIS METHOD OF ROTARY KILN INTERIOR

Kunihiko Tokutake, Kakogawa; Nobuo Mizokami, Ono, and Hiroyuki Tanaka, Kakogawa, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jun. 22, 1983, Ser. No. 506,612
Claims priority, application Japan, Jun. 28, 1982, 57-111957
Int. Cl.³ G01D *21/02*; G01M *19/00*; G01N *33/18*
U.S. Cl. 73—432 R 11 Claims



1. A method for diagnosing the interior of a rotary kiln operated using flames from pulverized coal burners as its heat source by estimating the extent of deposition of ash and its analogous substances on the inner wall of the rotary kiln upon, after charging the rotary kiln with a principal charging material composed of a mixture of the principal charging material in a pellet like state and in a powdery or fine state, said charging material supplied to the kiln in a travelling grate, in order to subject the charging material thus supplied to the rotary kiln to heating therein, thereby indurating said material, which method comprises:

inserting detector means for estimating the build-up of ash and its analogous substances inside the rotary kiln, at a position adjacent to the discharge end of the travelling grate, into a gas stream being blown from the rotary kiln;

taking out the detector means after an elapsed time of a predetermined period;

determining the measured deposit weight (Wi) on the detector means, the deposit density (ρm) and the percentage contribution of each of a plurality of components of the deposit, respectively;

calculating (a) a corrected ash deposit weight (Wa) by correcting the measured deposit weight (Wi) in view of the ash weight percentage (CA) present in pulverized coal used as fuel for the burners, (b) a corrected weight accounting for deposited fine charging material (Wd) by correcting the measured deposit weight (Wi) in accordance with the fine charging material percentage (F) present in the prefired material in the vicinity of the discharge end of the travelling grate and the percentage (C) of the deposit resulting from the fine charging material which was determined on the basis of the determined portions of the composition of the deposit and corresponding portions of the composition of the prefired fine charging material, and (c) the ash deposit weight (Ri) for estimating the extent of the deposit at an elevated temperature region in the rotary kiln, said ash deposit weight (Ri) being determined from the corrected weight accounting for deposited fine charging material (Wd) and the deposit density (ρm), respectively; and

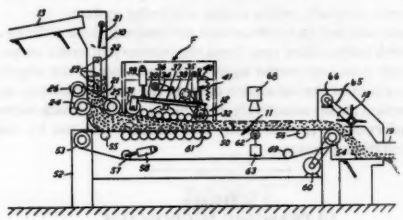
estimating the extent of deposition of ash and its analogous substances on the inner wall of the rotary kiln by choosing either any one of Wi, Wa or Wd and comparing it with a corresponding preset reference value thereof and similarly comparing the value of ρm with a corresponding preset reference value thereof and judging the value thereof or optionally further taking Ri into consideration.

4,510,808

APPARATUS FOR THE CONTINUOUS MEASUREMENT OF BULK DENSITY MATERIAL SUCH AS CUT TOBACCO

Richard E. G. Neville, Salisbury, England, assignor to AMF Incorporated, White Plains, N.Y.

Filed May 26, 1983, Ser. No. 498,354
Claims priority, application United Kingdom, Jun. 2, 1982, 8216028
Int. Cl.³ G01N *9/02*
U.S. Cl. 73—433 11 Claims



1. An apparatus for the continuous measurement of the bulk density of particulate material comprising:

a weighing conveyor having a compression zone and a weigh span downstream of the compression zone;

means for feeding the material to said compression zone;

a compression unit at said compression zone;

a series of rollers in said compression unit disposed on axes extending traverse to the direction of movement of the weighing conveyor;

transducer means provided at the weigh span for producing signals proportional to the material weight; and

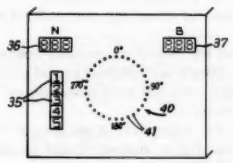
an endless belt embracing said series of rollers to provide a continuous surface adjacent to said weighing conveyor in the compression zone.

4,510,809

DEVICE FOR MEASUREMENT OF AMPLITUDE AND ANGULAR POSITION OF AN UNTRUE RUNNING IN A REVOLVING SYSTEM

Jean-Claude Fillion, Paris, France, assignor to S.N.E.C.M.A., Paris, France

Filed Dec. 22, 1983, Ser. No. 564,178
Claims priority, application France, Apr. 3, 1983, 83 00004
Int. Cl.³ G01M *1/16*
U.S. Cl. 73—457 7 Claims



1. Apparatus for measuring the amplitude of an untrue running of a revolving system and the angular position of the imbalance causing said untrue running, from output signals provided by a vibratory acceleration sensor and a speed of rotation and position sensor associated with the revolving system, the apparatus including

a first processing circuit having an input which is adapted to receive the output signals from the vibratory acceleration and the speed of rotation and position sensors, said circuit including integration and filter means for providing a first

output signal representative of the amplitude of any untrue running of the revolving system,

a second processing circuit having two inputs which are respectively adapted to receive the output signal from the speed of rotation and position sensor and said first output signal, and which circuit includes means for determining the phase difference between said input signals,

a memory in which is stored information at different locations for different revolving systems and/or different test conditions, representative of the difference between said determined phase difference and a true angular position of an imbalance causing untrue running with reference to a predetermined origin on the revolving system,

means adapted to combine said determined phase difference with information read from the memory in order to provide a second output signal representative of the angular position of the imbalance causing the untrue running; and

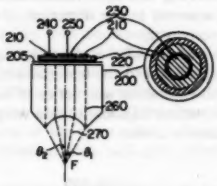
selection means selectively actuable to control which stored information is read from said memory for use by said combining means.

4,510,810

ULTRASONIC MICROSCOPE

Hiroshi Kanda, Tokorozawa, and Isao Ishikawa, Hino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 454,026
Claims priority, application Japan, Jan. 14, 1982, 57-3449
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—606 **4 Claims**



1. An ultrasonic microscope comprising:

a single transducer for generating an ultrasonic beam to be focused at a single focal point and for detecting a reflected echo of said ultrasonic beam, said single transducer including an acoustic lens having opposite surfaces, one of said surfaces being a spherical surface and the other of said surfaces being a planar surface, and a thin piezoelectric film formed on said planar surface of said acoustic lens;

driving means for driving said transducer;

receiving means for receiving the echo detected in said transducer;

scanning means for two-dimensionally scanning a relative position of a sample with respect to said ultrasonic beam at least in a plane normal to a direction of travel of said ultrasonic beam;

display means for selectively displaying a first image obtained by scanning an output of said receiving means in synchronism with the two-dimensional scan by said scanning means, and a second image obtained by scanning the output of said receiving means in synchronism with a time axis scan of a received signal and a scan synchronized with the scan in one direction of said two-dimensional scan, said first image being an ultrasonic image of said sample in a plane parallel to said plane, and said second image being an ultrasonic image of a cross-section of said sample normal to said plane; and

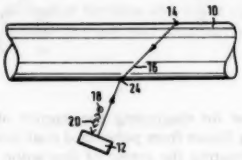
switching means for changing over an effective aperture of said transducer so that a first effective aperture is provided when the display of said first image is selected, sand a second effective aperture is provided with the display of said second image is selected, said first effective aperture being larger than said second effective aperture.

4,510,811

METHOD FOR DISTINGUISHING BETWEEN INTERFERING SIGNALS AND SIGNALS INDICATING DEFECTS OF WORKPIECES DURING ULTRASONIC TESTING

Walter Sternberg, Alzenau; Fritz Schreyer, Langenselbold, and Ursula Ruth, Ronneburg, all of Fed. Rep. of Germany, assignors to NUKEM GmbH, Hanau, Fed. Rep. of Germany

Filed Jan. 4, 1983, Ser. No. 455,554
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204797
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—611 **2 Claims**



1. A process for the ultrasonic, non-destructive testing of a workpiece disposed in a liquid medium where a transducing means is employed to expose the workpiece to acoustic waves traveling through the liquid medium and an interference member is disposed in the liquid medium between the workpiece and the transducer, comprising the steps of:

transmitting a first impulse wave from the transducing means,

detecting the first echo of said first impulse wave from the surface of the workpiece and noting the elapsed time period between the transmission and detection of the echo of said first impulse wave, said elapsed time period defining a time zone and corresponding to an area of wave transmission wherein unwanted obstructions could be located resulting in an unwanted echo signal,

establishing with said interference member an adjustable threshold signal level, and

suppressing, during a test cycle, any signal which exceeds said threshold signal level and which falls within said time zone.

4,510,812

APPARATUS FOR ACOUSTIC EMISSION DETECTION INCLUDING A WAVEGUIDE MADE OF ALUMINUM OR BERYLLIUM OXIDE

Ching C. Feng, San Juan Capistrano, Calif., assignor to Dunegan Corporation, Knoxville, Tenn.

Filed Dec. 20, 1982, Ser. No. 451,581
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—644 **5 Claims**

1. Waveguide apparatus for examining acoustic emission signals from objects of interest, comprising:

(a) an elongated solid waveguide body having first and second ends;

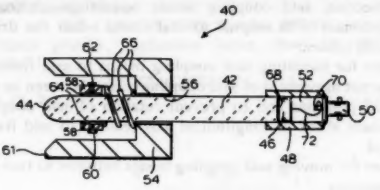
(b) a piezoelectric sensor mounted on said first end of said body;

(c) electrical connection means connected to said sensor for containing said apparatus to acoustic emission signal response mechanisms;

(d) a cup-shaped magnetic hold-down fixture connected to said body for holding said second end of said body against an object to be examined said hold-down fixture being connected one the end of said body opposite said sensor

with said body being mounted for relative longitudinal movement in said hold-down fixture;

(e) said body being made of a material selected from the group consisting of aluminum oxide and beryllium oxide;



(f) resilient means mounted between said hold-down fixture and said body for urging one end of said body against in object of interest.

4,510,813

TEMPERATURE COMPENSATION CIRCUIT FOR STRAIN GAUGES

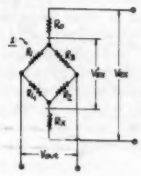
Jitsuo Kanazawa, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Shiga, Japan

Filed Dec. 9, 1982, Ser. No. 448,205

Claims priority, application Japan, Dec. 23, 1981, 56-194440[U]

Int. Cl.³ G01B *7/16*

U.S. Cl. 73—766 **8 Claims**



1. A temperature compensation circuit for strain gauges adapted to produce an output conforming to a strain by being fed with a constant voltage, said circuit being characterized in that compensation resistors comprising a combination of two or more kinds of resistors each made of pure single metal material and having a resistance versus temperature characteristic equivalent to the output voltage versus temperature characteristic of a bridge circuit of said strain gauges are connected to the bridge circuit of strain gauges, thereby compensating for variations in strain gauge output due to variations in temperature.

4,510,814

SNAP-IN FORCE SENSOR WITH BELLOWS

Eugenio Espiritu Santo; Kenneth D. Baxter, both of Cedar Falls, Iowa, and Gary R. Bluem, Wayzata, Minn., assignors to Deere & Company, Moline, Ill.

Filed Apr. 1, 1982, Ser. No. 364,372

Int. Cl.³ G01L *5/13*

U.S. Cl. 73—862.57 **7 Claims**

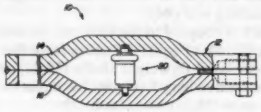
1. A force sensor comprising:

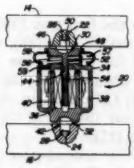
a deformable frame having spaced-apart portions having a variable separation depending on force-induced deformation of the frame;

a housing enclosing a transducer chamber therein, one end of the housing having means for coupling to one of the spaced-apart portions, the other end of the housing having a bore extending completely therethrough and communicating with the chamber;

a position transducer disposed entirely within the chamber and having first and second relatively movable parts, the first part being carried for movement with the housing, the housing also enclosing an outer chamber for sealingly enclosing elements of a transducer circuit operably coupled to the transducer;

a plunger member having a coupling part engageable with the other of the spaced-apart portions and a shaft slidably received by the bore and extending through the bore from the coupling part to an end fixed to the second transducer part; and





a resilient bellows member spaced apart from the frame, exterior to the housing and flexibly and sealingly interconnecting the plunger member and the housing to prevent contamination of the transducer, the bellows being biased to urge the plunger member and the housing away from each other and the bellows being deformable to permit the housing and plunger member to be inserted into and removed from the frame.

4,510,815

FLYWEIGHT VIBRATOR DESIGNED AS DIRECTIONAL VIBRATOR

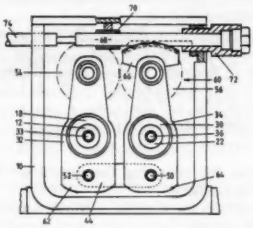
Johannes Bäumers; Werner Lisken, both of Düsseldorf, and Heinz Lietzke, Neuss, all of Fed. Rep. of Germany, assignors to Losenhausen Maschinenbau AG, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 2, 1982, Ser. No. 394,717

Claims priority, application European Pat. Off., Jul. 18, 1981, 81710026.6

Int. Cl.³ F16H *33/00, 33/20*

U.S. Cl. 74—61 **4 Claims**



1. A flyweight vibrator designed as a directional vibrator with the direction of oscillation being adjustable, comprising

(a) a housing (10)

(b) A first flyweight shaft (12), which

(b_1) is mounted in the housing (10),

(b_2) carries a first flyweight (16),

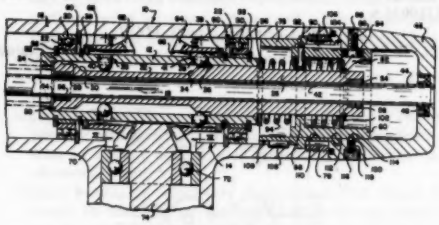
(b_3) is connected to a first gear (18) and
(b_4) is adapted to be driven by a motor,
(c) a second flyweight shaft (22), which
(c_1) is mounted in the housing (10) parallel to the first flyweight shaft (12),
(c_2) carries a second flyweight (28) and
(c_3) is connected to a second gear (30),
(d) a first oscillating crank (32) pivotably mounted about the axis (33) of the first flyweight shaft (12),
(e) a second oscillating crank (34) mounted for pivoting about the axis (36) of the second flyweight shaft (22),
(f) a connecting rod (44)
(f_1) which is coupled to the first and the second oscillating crank (32,34) at equal distances from the axes (33,36) of the associated flyweight shafts (12,22) and
(f_2) the effective length of which is equal to the distance of these axes (33,36) from each other,
(g) a first intermediate gear (54), which
(g_1) is mounted for rotation on the first oscillating crank (32) at a distance from the axis (33) of the first flyweight shaft (12) and
(g_2) meshes with the first gear (18),
(h) a second intermediate gear (56), which
(h_1) is mounted for rotation on the second oscillating crank (34) at a distance from the axis (36) of the second flyweight shaft (22) equal to the distance of the first intermediate gear (54) from the axis (33) of the first flyweight shaft (12),
(h_2) meshes with the second gear (30) and
(h_3) meshes with the first intermediate gear (54) and
(i) a shifting mechanism (60) arranged to rotate the two oscillating cranks characterized in that
(j) each of the oscillating cranks has a counterweight on the side opposite the intermediate gear and is individually mass-balanced thereby with respect to its pivotal axis, such that oscillations of the vibrator, even if they do not fall into the longitudinal direction of the oscillating cranks, do not exert any torque upon the oscillating cranks about the axes of the flyweight shafts.

4,510,816

APPARATUS FOR CHANGING THE DIRECTION OF ROTATION OF A ROTATING SHAFT

Harry A. Linden, Santa Barbara, Calif., assignor to American Sterilizer Company, Erie, Pa.

Filed Dec. 31, 1981, Ser. No. 336,050
Int. Cl.³ F16H *3/08, 3/14*
U.S. Cl. 74—372 **5 Claims**



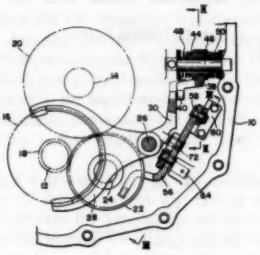
1. Apparatus for changing the direction of rotation of a driven shaft comprising:
a frame to which the shaft is mounted for rotation about its longitudinal axis;
two members disposed on the shaft for rotational movement thereabout;
means for engaging said members and rotating each said member in a direction opposite to that of the other said member;
means for mechanically coupling a first said member to the shaft when said coupling means assumes a first position relative to said frame to permit said first member to rotate the shaft in a first direction, and for mechanically coupling a second said member to the shaft when said coupling means assumes a second position relative to said frame to permit the second member to rotate the shaft in a second direction, said coupling means remaining rotationally stationary with respect to said frame when the driven shaft rotates;
means for mounting said coupling means to said frame to permit movement of said coupling means between its two said positions and to prevent rotation of said coupling means about its longitudinal axis relative to said frame; and
means for moving said coupling means between its two said positions.

4,510,817

GEAR OPERATING MECHANISM OF AN AUTOMOTIVE MANUAL TRANSMISSION

Tamio Kawamoto, and Kazuyoshi Hiraiwa, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 18, 1982, Ser. No. 379,507
Claims priority, application Japan, May 19, 1981, 56-74097
Int. Cl.³ G05G *5/10, 9/12*
U.S. Cl. 74—477 **8 Claims**



1. In a selected gear sliding type manual transmission having a case, a speed shift gear lever, and a gear which is axially slidable from its neutral position where it disengages from the associated gears to its operating position where it engages with the associated gears, a gear operating mechanism, comprising:
a first lever pivotally connected to said case to be pivoted about a first axis to move said gear between said neutral position and said operating position;
a second lever pivotally connected to said case to be pivoted about a second axis which extends parallel with said first axis;
a third lever having one end pivotally connected at a third axis to said first lever and its other end pivotally connected at a fourth axis to said second lever, so that during the pivotal movement of said first lever about said first axis said third lever pivots about said third axis and said fourth axis which are respectively arranged on said first and second levers; and
means for pivotally moving said second lever about said second axis in response to the movement of said speed change shift lever of the transmission,
wherein said first, second and third levers are so arranged and constructed that when they assume their respective positions to cause said gear to assume said operating position, said second, fourth and third axes are located substantially on a straight line in this order, whereas when they assume their respective positions to cause said gear to assume said neutral position, said second, fourth and third axes are located at the apexes of a predetermined triangle.

4,510,818
DEVICE FOR PREVENTING REVERSE GEAR BUZZING IN A MANUAL TRANSMISSION

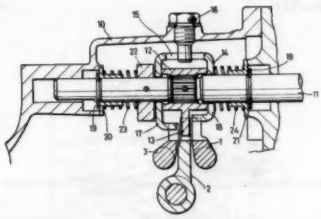
Masaki Inui, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Mar. 29, 1983, Ser. No. 479,876

Claims priority, application Japan, Nov. 19, 1982, 57-175760[U]

Int. Cl.³ G05G *9/12, 5/10*

U.S. Cl. 74—477 **6 Claims**



1. In combination with a manual transmission for automotive vehicles including a transmission casing, a forward speeds unit provided with a plurality of synchromesh mechanisms and having shift heads for the forward speeds, a reverse unit provided with a selective sliding mesh mechanism of a reverse idler gear and having a reverse shift head, a shift-and-select lever shaft mounted in said transmission casing, an inner lever attached to said shift-and-select lever shaft and an interlocking plate relatively rotatably mounted to said shift-and-select lever shaft and holding said inner lever at its both ends, said interlocking plate serving to hold immovable at the neutral position the remaining shift heads other than one of said shift heads which is selected by the select operation of said inner lever; a device for preventing reverse gear buzzing comprising:

a first front engaging member of the forward speed shift head adjacent to said reverse shift head for releasably engaging with said inner lever when said inner lever is selected into the reverse position;

a first rear engaging member provided on said forward shift head adjacent to said reverse shift head;

a second front and rear engaging members provided on said reverse shift head;

first means for contacting with said interlocking plate at the reverse select position, moving said reverse shift head and said forward shift head with said inner lever by a predetermined amount in the reverse shifting direction and thereafter disengaging said inner lever from said forward speed shift head, said first means being provided on said reverse shift head; and

second means for preventing said interlocking plate from abutting against said rear engaging member of said forward speed shift head when said forward speed shift head moves in the reverse shifting direction by said predetermined amount.

4,510,819
DEVICE FOR PREVENTING REVERSE GEAR BUZZING IN A MANUAL TRANSMISSION

Masaki Inui, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Mar. 29, 1983, Ser. No. 479,879

Claims priority, application Japan, Nov. 15, 1982, 57-173435[U]

Int. Cl.³ G05G *9/12, 5/10*

U.S. Cl. 74—477 **8 Claims**

1. A device for preventing reverse gear buzzing in a manual transmission comprising:

a transmission casing;

a forward speeds unit provided with a plurality of synchromesh mechanisms and having shift heads for the forward speeds;

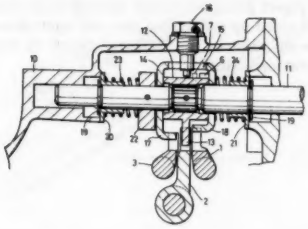
A reverse unit provided with a selective sliding mesh mechanism of a reverse idler gear and having a reverse shift head;

a shift-and-select lever shaft mounted in said transmission casing;

an inner lever attached to said shift-and-select lever shaft;

an interlocking plate loosely mounted to said shift-and-select lever shaft and holding said inner lever at its both ends, said interlocking plate serving to hold immovable at the neutral position the remaining shift heads other than one of said shift heads which is selected by the select operation of said inner lever;

a locking means fixed to said transmission casing and adapted to hold said interlocking plate in such a manner that said interlocking plate is permitted to axially move together with said lever shaft and to rotate relative to said lever shaft;



stopper formed on the shift head adjacent to said reverse shift head and adapted to be engaged with and disengaged from said inner lever; and

means mounted on said inner lever for abutting against said locking means at the reverse select position of said inner lever in such a manner that after abutting of said abutting means against said locking means said inner lever is permitted to slightly move in the shift and select directions and subsequently move only in the shift direction, whereby said reverse shift head and said shift head adjacent thereto are moved together slightly in the shift direction because of engagement of said interlocking plate with said reverse shift head and said stopper, and thereafter said reverse shift head alone is moved in the shift direction because of disengagement of said interlocking plate from said stopper and engagement thereof only with said reverse shift head.

4,510,820
DRUM TYPE SWITCH-OVER MECHANISM FOR A SPEED CHANGE DEVICE

Masaharu Tsuboi, Sayama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 1, 1983, Ser. No. 481,392

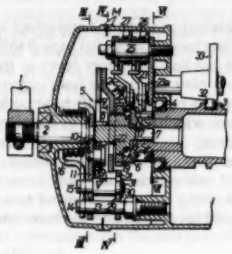
Claims priority, application Japan, Apr. 1, 1982, 57-54433

Int. Cl.³ G05G *1/14;* **F16H** *1/28;* **F16D** *41/16*

U.S. Cl. 74—474 **9 Claims**

1. In a drum type switch-over mechanism for a speed change device comprising a transmission case, a speed change pedal shaft, a speed change drum, said speed change pedal shaft and said speed change drum being rotatably supported on the transmission case, a speed-up mechanism and an intermittent feed mechanism for operatively connecting said pedal shaft and said speed change drum together via said speed-up mechanism, the speed change drum being adapted to rotate by a unit angle in a predetermined direction on every reciprocatable rotation of the pedal shaft by a predetermined angle, the improvement wherein the pedal shaft is located in axial alignment

with an input shaft of said intermittent feed mechanism, said speed-up mechanism comprises a sun gear formed on said input shaft, a plurality of planet gears mounted on said pedal shaft for meshing engagement with the sun gear, and a ring gear meshing with said planet gears and fixedly secured to the transmission case, said speed-up mechanism and said intermittent feed mechanism being disposed on different planes in the axial direction of said input shaft.



4,510,821

DEVICE FOR MAKING A FIRM, BUT RELEASABLE JOINT BETWEEN A STEERING WHEEL AND A LOCKING BOLT

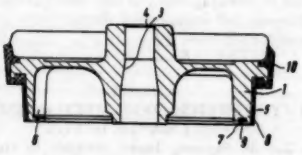
Wolfgang Bauer, Karlsting, and Werner Grosser, Sulzbach, both of Fed. Rep. of Germany, assignors to Karl Schmidt GmbH, Neckarsulm, Fed. Rep. of Germany

Continuation of Ser. No. 207,096, Nov. 14, 1980, abandoned. This application Sep. 23, 1983, Ser. No. 534,932

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1979, 2945937

Int. Cl.[3] **B62D** *1/04*

U.S. Cl. 74—552 **1 Claim**



1. A steering wheel of the type connected to a steering column and which is engageable by a locking bolt movable by a locking cylinder to lock said steering wheel with respect to said column, wherein said steering wheel comprises a diecast steering wheel hub which has a central opening and one side of which faces a steering column during use, said one side being concave and having a cylindrical flange attached thereto and having a free end, said cylindrical flange being concentric to said central opening and having means including lands provided on its inside peripheral surface forming a multiplicity of axial grooves for receiving a locking bolt, each of said axial grooves extending to the free end of the flange, and a ring disposed at the free end of the flange and facing the axial grooves and firmly connected to said lands.

4,510,822

CONTINUOUSLY VARIABLE V-BELT TRANSMISSION INCLUDING HYDRODYNAMIC TRANSMISSION UNIT WITH LOCK-UP MEANS

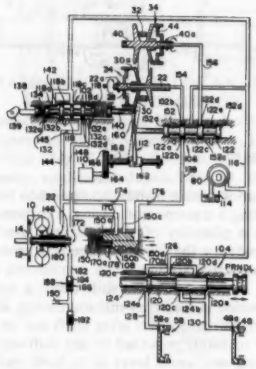
Sigeaki Yamamuro, Zushi; Hiroyuki Hirano; Yoshiro Morimoto, both of Yokosuka, and Yoshikazu Tanaka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 26, 1982, Ser. No. 362,491

Claims priority, application Japan, Mar. 28, 1981, 56-44746; Mar. 28, 1981, 56-44751

Int. Cl.[3] **F16H** *47/00, 55/52;* **F16D** *33/00, 35/00*

U.S. Cl. 74—733 **10 Claims**



1. A continuously variable V-belt transmission comprising:

a continuously variable V-belt transmission unit having a drive shaft and a driven shaft;

a hydrodynamic transmission unit having an input member and an output member drivingly connected to said drive shaft of said continuously variable V-belt transmission unit, said hydrodynamic transmission unit including a lock-up clutch having an engaged state wherein said input member is mechanically connected to said output member so as to place said hydrodynamic transmission unit in a lock-up mode, said lock-up clutch having a disengaged state wherein said input member is out of mechanical connection with said output member, said lock-up clutch including a lock-up chamber and being shiftable responsive to fluid pressure in said lock-up chamber to one of said engaged and disengaged states;

said continuously variable V-belt transmission unit having a V-belt running over a drive and a driven pulley, each having a cylinder chamber and two conical discs, one conical disc of said drive pulley being secured to said drive shaft, one conical disc of said driven pulley being secured to said driven shaft, the other conical disc of said drive pulley being controllably movable in an axial direction of said drive shaft in response to fluid pressure in said cylinder chamber of said drive pulley, the other conical disc of said driven pulley being controllably movable in an axial direction of said driven shaft in response to fluid pressure in said cylinder chamber of said driven pulley;

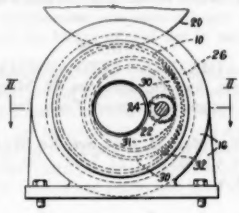
a switch valve including means defining a valve chamber communicating with said cylinder chamber of said drive pulley, a valve element and means, including a spring, for biasing said valve element toward said valve chamber, said valve element being movable responsive to fluid pressure within said cylinder chamber of said drive pulley between a first position wherein fluid pressure is discharged from said lock-up chamber and a second position wherein fluid pressure is supplied to said lock-up chamber.

4,510,823

DRIVE FOR SHELL TYPE ROLLS

Francis Leech, Seymour, Conn., assignor to USM Corporation, Farmington, Conn.

Filed Dec. 21, 1981, Ser. No. 332,482
Int. Cl.³ F16H *57/10*; B60B *15/16*
U.S. Cl. 74—789 **5 Claims**



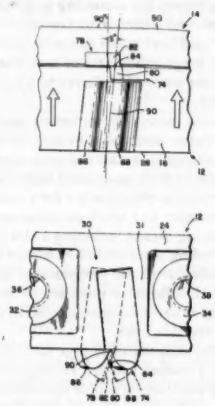
1. A mechanism for driving a deflectable rotary member including:
a driven pinion;
a support for mounting the pinion for rotation on a fixed axis and for mounting the rotary member on a deflectable axis;
a first ring gear secured to the rotary member;
a second ring gear having internal and external gear teeth supported by meshing engagement between the teeth of the pinion and the first ring gear for rotation about an axis which oscillates bodily according to deflection of the rotary member for maintaining meshing engagement with the teeth of the pinion and the first ring gear.

4,510,824

SHARPENER DEVICE WITH GUIDE MEANS

John E. Byers, P.O. Box 556, Whitefish, Mont. 59937

Filed Feb. 28, 1983, Ser. No. 462,743
Int. Cl.³ B21K *5/12*
U.S. Cl. 76—86 **8 Claims**



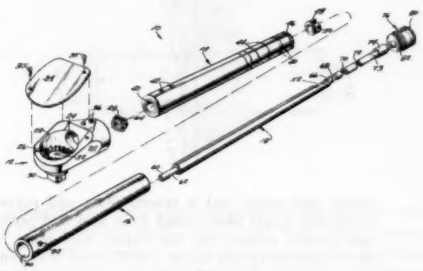
1. A sharpening device, comprising:
(a) a body which includes flat, removable sharpening blade means which are supported in and extend out of said body and which define a generally V-shaped sharpening notch for blades to be sharpened,
(b) guide slot means on said body aligned with and for guiding said blades to be sharpened through said V-shaped sharpening notch, said guide slot means being disposed at a predetermined angle to a line which is normal to the sharpening blade means and said guide slot means being in the same general perpendicular plane as the bottom of said V-shaped sharpening notch, said bottom of said V-shaped sharpening notch being spaced above said guide slot means a slight predetermined distance.

4,510,825

MULTI-POSITION DRIVE RATCHET WRENCH

Joseph Neron, 4 Minnesota Ave., West Glen Falls; William S. Hudson, 5 Terra Cotta Ave., Glens Falls, both of N.Y. 12801, and Ronald L. Miller, R.D. #1 Box #62, Geer Rd., Hudson Falls, N.Y. 12839

Continuation of Ser. No. 202,428, Oct. 30, 1980, abandoned.
This application Apr. 22, 1983, Ser. No. 485,759
Int. Cl.³ B24B *17/00*
U.S. Cl. 81—57.29 **6 Claims**



1. A right angle socket wrench having a plurality of operating modes comprising housing means for providing the main support for the wrench, drive system means movably positioned with respect to said housing means for providing a plurality of operational modes and for transmitting driving forces applied thereto, said drive system means including a drive lug, a drive shaft, gearing means for connecting said drive shaft to said drive lug and handle means adjustably mounted to said housing means and said drive shaft so as to be axially and rotatably movable with respect thereto for selecting one of said plurality of operational modes and for applying clockwise or counterclockwise driving forces to said drive shaft in only one of at least five predetermined operational modes, respectively, said plurality of operation modes includes clockwise and counterclockwise ratcheting together with complementary counterclockwise and clockwise drives, respectively, a fully locked condition in which said drive shaft, said housing means and said handle means are locked together as an integral unit, an idle condition mode for said drive shaft and said handle means where said drive shaft can be driven independently of said handle means and a partially locked condition where said handle means and said drive shaft are locked together independently of said housing means.

4,510,826

EXTENSION FOR A SCREWGUN

Milton Marks, Pittsburgh, Pa., assignor to Guardian Fasteners and Closure Systems, Coraopolis, Pa.

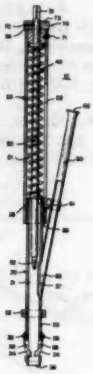
Filed Mar. 7, 1983, Ser. No. 472,579
Int. Cl.³ B25B *23/02*
U.S. Cl. 81—57.37 **11 Claims**

1. An attachment for a screwgun comprising:
a hollow barrel having a portal in its side for receiving a fastener;
a hollow sleeve adapted for sliding movement relative to said barrel;
a drive member disposed within the hollow portions of said barrel and said sleeve and adapted to coact with the drive of the screwgun to transfer the driving force of the screwgun to the fastener;

means for biasing said barrel and said sleeve apart; and

means hingedly connected to said barrel for delivering a fastener through said portal into said barrel;

said delivering means being capable of assuming a first position in which an outlet end of said delivering means is in communication with said portal and a second position in



which said outlet end is spaced from said portal, said delivering means being eased from said first position to said second position by the sliding movement of said sleeve relative to said barrel past the area of communication between said portal and said outlet end of said delivering means.

4,510,827

WIRE STRIPPING ARRANGEMENT

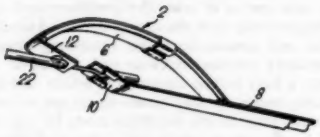
Regis Flot, Eragny, France, and Jean Patrick Hine, San Carlos, Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 24, 1982, Ser. No. 444,129

Claims priority, application United Kingdom, Nov. 27, 1981, 8135940

Int. Cl.³ H02G *1/12*

U.S. Cl. 81—9.4 **14 Claims**



1. An arrangement for stripping the insulation of an elongate, insulated electrical conductor, the arrangement comprising:

at least two stripping members, each having a cut-out portion defined by an edge; and

a recoverable member in cooperative engagement with each of said stripping members, said recoverable member having an original undeformed shape and a deformed shape wherein the original undeformed shape is recoverable from the deformed shape by application of heat thereto, said recoverable member being in the deformed shape;

said stripping members positioned prior to recovery of the recoverable member opposed to one another with their cut-out portions aligned so as to form an aperture for receiving the conductor;

the recovery of said recoverable member effecting relative movement of said stripping members (a) laterally of the conductor so that the aperture is effectively reduced in size, the edges of the cut-out portions penetrating the insulation of the insulated conductor, and (b) longitudinally of the conductor so that the edges of the cut-out portions cooperate to displace at least a portion of the insulation longitudinally of the conductor;

wherein said stripping members are arranged to interengage each other such that said longitudinal movement is effected after said lateral movement has substantially been completed, wherein said interengagement is effected by one of said members being slidably disposed within a channel provided on the other of said members.

4,510,828

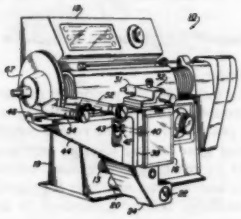
LATHE CROSS FEED ASSEMBLY

Leo C. Bogaerts, Antioch, and John W. Murphy, Waukegan, both of Ill., assignors to Ammco Tools, Inc., North Chicago, Ill.

Filed Mar. 23, 1984, Ser. No. 592,899

Int. Cl.³ B23B *3/22, 5/04, 7/00, 21/00*

U.S. Cl. 82—4 A **12 Claims**



1. A cross feed assembly for use with a lathe having an arbor and drive means for rotating the arbor, comprising in combination

a boring bar assembly,

first and second facing tool cutter assemblies,

said cross feed member having a first planar surface parallel with the longitudinal axis of said arbor and a second planar surface perpendicular to said first planar surface,

first mounting means for mounting said boring bar assembly to said cross feed member to permit rotational linear adjustment of said boring bar assembly within a plane parallel with the longitudinal axis of said arbor for positioning said boring bar assembly relative to a work piece mounted on said arbor,

second mounting means for mounting said first and second facing tool cutter assemblies to said cross feed member to permit simultaneous rotational and linear adjustment of said facing tool cutter assemblies within a plane parallel to the axis of rotation of said arbor for positioning said cutter assemblies relative to a work piece mounted on said arbor,

said first mounting means including a slot in said first planar surface extending across said first planar surface in a direction perpendicular to the longitudinal axis of said arbor,

a first elongated, adjustable attachment member,

said slot having a configuration adapted to receive and retain said attachment member,

a clamp member adapted to engage said boring bar assembly and having a planar surface resting on said first planar surface, and also having a hole therethrough aligned with said slot in said first planar surface through which said attachment member passes to engage said slot,

whereby said clamp member and said boring bar assembly are rotationally and linearly positionable on said first planar surface throughout the length of said slot,

said first and second mounting means including means for adjustably positioning said boring bar assembly and said facing tool cutter assemblies relative to one another for allowing selective use of said assemblies while all of said assemblies are mounted to said lathe,

said second mounting means including a slot in said second

planar surface extending across said second planar surface in a direction perpendicular to the longitudinal axis of said arbor,

a second elongated adjustable attachment member,

said slot in said second planar surface having a configuration adapted to receive and retain said second elongated attachment member,

a tool secured to said second planar surface by said second elongated adjustable attachment member and being adjustably positionable on said second planar surface throughout the length of said slot in said second planar surface,

said tool including a third planar surface parallel to the longitudinal axis of said arbor and having a slot therein extending across said third planar surface in a direction parallel to the longitudinal axis of said arbor,

a third elongated adjustable attachment member,

said slot in said third planar surface having a configuration adapted to receive and retain said third attachment member, and

at least one tool holder for holding one of said facing tool cutter assemblies,

said at least one tool holder being mounted on said third planar surface by said third attachment member,

whereby said tool holder is rotationally and linearly positionable on said third planar surface throughout the length of said slot in said third planar surface.

4,510,829

CLAMPING DEVICE FOR TOOL ASSEMBLIES

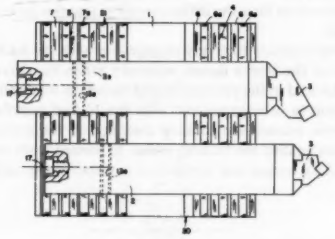
Gerhard Kintzel, and Edmund Heilmann, both of Schweinfurt, Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 2, 1982, Ser. No. 446,398

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151275

Int. Cl.³ B23B *29/08*

U.S. Cl. 82—36 R **8 Claims**



1. A tool assembly comprising a tool, a support base **(1)** having first guideways formed by at least two groups of spaced first rib-like projections **(6*a*, 7*a*)** and grooves **(6, 7)** disposed at an oblique angle relative to the base and extending generally transversely to the feed direction of said tool, at least one tool holder **(2)** mounted on the base **(1)** having a main section **(10)** and a clamping section **(11)**, means securing said tool to said main section, complementary second guideways formed by a series of spaced second rib-like projections **(8, 9)** complementing the first rib-like projections and interengageable therewith, said second rib-like projections **(8, 9)** projecting from said main section and clamping section, means **(12, 22)** to allow limited relative movement of said main section and clamping section and actuator means **(16, 26, 33)** operable to effect said relative displacement of said main section and clamping section and thereby displacement of said second rib-like projections in a direction generally parallel to the base to effect pressure applying relation of said second rib-like projections of the tool holder and at least some of said first rib-like projections of the base so that the side faces of the ribs interengage in a manner providing a clamping component between the interengaging ribs of said first and second guideways.

4,510,830

APPARATUS FOR CUTTING THROUGH OR TRIMMING A PIPE OR CAN IN A PLANE TRANSVERSE TO ITS LONGITUDINAL AXIS

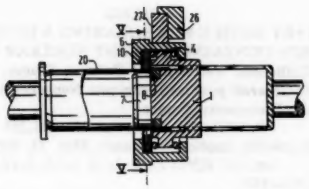
Willem P. Post, Bl Diepenveen, Netherlands, assignor to Thomassen & Drijver-Verblifa N.V., Deventer, Netherlands

Filed Apr. 20, 1983, Ser. No. 486,715

Claims priority, application Netherlands, Apr. 27, 1982, 8201746

Int. Cl.³ B23D *21/00*

U.S. Cl. 83—114 **13 Claims**



1. Apparatus for cutting circumferentially through the wall of a tubular workpiece such as a can body, comprising an inner shearing member presenting a continuous, outwardly directed, outer peripheral cutting edge received within the workpiece and an outer shearing member presenting a continuous, inwardly directed, inner peripheral cutting edge surrounding the workpiece, and means for moving said cutting edges relative to each other substantially only in radial directions with respect to the workpiece in continuous, progressive fashion completely around the circumference of the workpiece to effect the cutting thereof.

4,510,831

DEVICE FOR CUTTING SHEET METAL AND THE LIKE

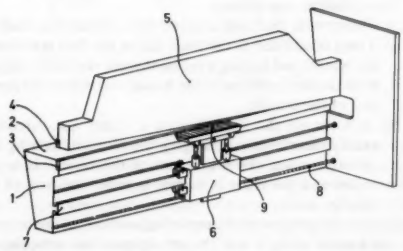
Theo Jäger, Huttenheimer Str. 46, and Helmut Schmid, Kronenstrasse 10, both of 7522 Philippsburg-Rheinsheim, Fed. Rep. of Germany

Filed Nov. 21, 1983, Ser. No. 553,858

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243257

Int. Cl.³ B26D *7/18, 7/20*

U.S. Cl. 83—157 **12 Claims**



1. Device for cutting sheet metal and similar materials, having a lower cutting blade and a cooperating upper cutting blade that is lowerable so as to run at a certain cutting angle relative to the lower cutting blade, having also a support lying below the upper cutting blade for bracing a strip to be cut off against the cutting force, said support being guided so as to be

yieldable in the vertical direction, and having also the improvement comprising;

a carriage for said support mounted for travel below said upper cutting blade along the length thereof, so that said carriage performs the function of said support for bracing said strip, and

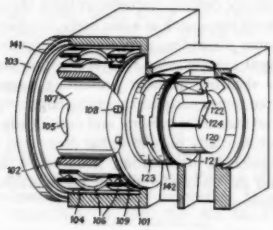
means for causing said carriage to move along its path of travel substantially in synchronism with the shift of the location of cutting by said blades along the length of said blades and in the same direction.

4,510,832

ROTARY DEVICE FOR SHEARING A BUNDLE OF TUBES CONTAINING BURNT NUCLEAR FUELS

René Guilloteau, Verrieres Le Buisson, France, assignor to Societe Generale pour les Techniques Nouvelles S.G.N., Montigny-Le-Bretonneux, France

Filed Mar. 24, 1982, Ser. No. 361,285
Claims priority, application France, Mar. 24, 1981, 81 05880
Int. Cl.³ B26D *1/25, 1/34, 1/38, 3/16*
U.S. Cl. 83—168 **10 Claims**



1. Apparatus for removing first the foot and then successive lengths of the tubes of a bundle of tubes containing nuclear fuel, comprising:

(a) means for supporting a bundle of tubes with the tubes in vertical position,

(b) means for moving the bundle from a first position in which the foot of the bundle is removed to a second position in which sections of the tubes are successively removed,

(c) means for cutting the foot of the bundle while it is in the first position, comprising

i. a horizontal shaft and a motor for rotating the shaft,

ii. a ring connected to the shaft below the first position of the bundle and having a recess therein vertically aligned with the first position of the bundle to receive the lower end of the bundle,

iii. a rotor on the shaft having a cutter bar extending axially therefrom overhanging the recess in the ring and operable when the lower end of the bundle is in the recess and the rotor is turned to sever the foot of the bundle, and

(d) means for progressively removing sections of the tubes of the bundle while it is in the second position comprising:

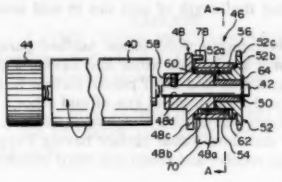
i. a circumferential series of teeth on the rotor positioned axially of said cutter bar and below the second position of the bundle and operable upon rotation of the rotor and positioning of the bundle in the second position to successively remove sections of the lower parts of the tubes as the bundle is lowered by gravity through said bundle moving means.

4,510,833

ONE-ROTATION CLUTCH

Osamu Uozumi, Zushi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 28, 1983, Ser. No. 566,468
Claims priority, application Japan, Dec. 29, 1982, 57-229854
Int. Cl.³ B26D *5/08*
U.S. Cl. 83—205 **11 Claims**



1. A one-rotation clutch for selectively establishing and interrupting transmission of a drive force from a drive source to a driven object, comprising:

a driven shaft integral with the driven object;

driven means rigidly mounted on said driven shaft and having a locking member;

drive means located to face said driven means and movably coupled over the driven shaft to be rotatable in a predetermined direction;

sleeve means rotatably disposed between the driven means and the drive means and having a locked member on an outer periphery thereof;

spring means disposed in said sleeve means with one end thereof retained by the driven means and the other end thereof retained by the sleeve means, said spring means being wound in such a direction that when the sleeve means is rotated in the predetermined direction with the driven means held in a halt, a coil diameter of the spring is reduced to bind the driven member and the drive member; and

locking means selectively engageable with the locked member of the sleeve means, whereby when the driven means is rotated in the predetermined direction while the locking means is in engagement with the locked member of the sleeve means, the locking member of the driven means abuts against the locking means to immediately release the locking means and the locked member from each other.

4,510,834

SIDING CUTTER

Dennis T. Greene, 612 Butler Springs Rd., Greenville, S.C. 29615, and Glen M. Salyers, P.O. Box 231, Lyman, S.C. 29365

Filed May 9, 1983, Ser. No. 492,507
Int. Cl.³ B23D *23/02*
U.S. Cl. 83—453 **5 Claims**

1. A vinyl and aluminum siding cutter comprising:

an elongated blade support;

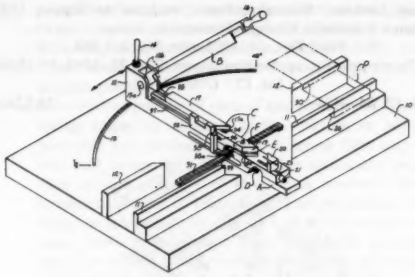
a manually depressable elongated upper blade carried by said support;

an elongated lower blade in alignment with said upper blade carried by said support;

a pivotal mounting means carrying said elongated blade support for angular adjustment in respect to said siding;

stop means carried adjacent said lower blade fixing said siding during cutting;

a surface carried by said lower blade and said stop means supporting said siding during cutting; and



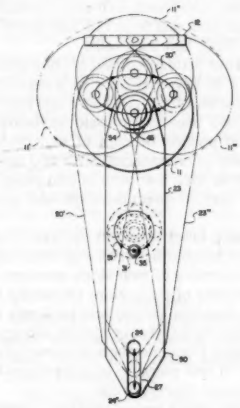
said stop means and said pivotal mounting means being in vertical alignment.

4,510,835

APPARATUS FOR GUIDING A POWERED CIRCULAR SAW ALONG AN ELLIPTICAL CUTTING PATH

Jeff Y. Cromeens, Mesquite, Tex., assignor to Industrial Woodworking Machine Co. Inc., Garland, Tex.

Filed Feb. 25, 1983, Ser. No. 469,821
Int. Cl.³ B27B *5/18*
U.S. Cl. 83—471.2 **2 Claims**



1. Apparatus for controlling the operating relationship of a rotatably driven saw blade to an adjacent workpiece comprising:

a base member,

an elongated slide member adjacent the base member and carrying the saw blade,

indexing means between said base member and one end of the slide member to constrain said one end of said slide member to linear movement,

a first motor mounted at the opposite end of said slide member for driving the blade,

the indexing means having guide means extending longitudinally of said slide plate,

said guide means comprising an elongated recess in one of said base and slide members, a roller mounted on the other of said members and oriented to engage the recess in said one of said members to constrain the movement of said one end of said slide member to linear movement,

crank means rotatably connected to the center portion of said slide member, and

a second motor carried by said base member for rotating the crank means to move the said slide member from side to side and up and down relative to said base member to move the center of the blade along an elliptical path,

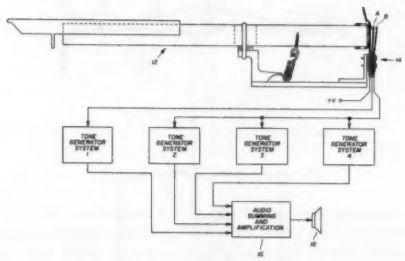
whereby operation of the second motor causes the blade to be brought into contact with the workpiece along a path generally parallel with a major axis of the elliptical path.

4,510,836

TOUCH SENSITIVITY IN AN ELECTRONIC MUSICAL INSTRUMENT HAVING NON-POSITIVE ATTACK

Jerome Markowitz, Allentown, Pa., assignor to Allen Organ Company, Macungie, Pa.

Filed Dec. 1, 1983, Ser. No. 557,031
Int. Cl.³ G10H *1/02, 1/08*
U.S. Cl. 84—1.26 **8 Claims**


TONE GENERATOR SYSTEM 1
TONE GENERATOR SYSTEM 2
TONE GENERATOR SYSTEM 3
TONE GENERATOR SYSTEM 4
AUDIO SUMMING AND AMPLIFICATION

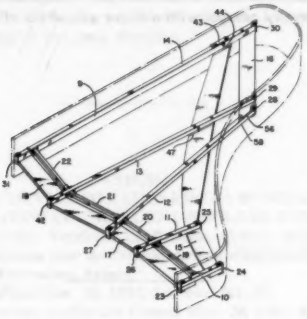
7. Method for providing touch sensitivity to the keys of an electronic musical instrument comprising the steps of: providing a plurality of tone generators for causing a poredetermined tonal output upon the actuation of a key, operating each of said tone generators sequentially by successively causing a delay of the predetermined tonal output from one or more additional tone generators after the first of said tone generators begins to sound, each of the sequentially and successively actuated additional tone generators having envelope characteristics containing an increasingly greater delay time than any previously actuated tone generator resulting in the combined tonal output varying in amplitude and tonal response in accordance with the speed or length of play of the key.

4,510,837

METHOD OF MANUFACTURING A PIANO PLATE ASSEMBLY AND THE ASSEMBLY

Keith T. Keller, 3614 Woodlawn Ave. N., Seattle, Wash. 98103

Filed Jan. 17, 1983, Ser. No. 458,868
Int. Cl.³ G10C *3/04, 3/08*
U.S. Cl. 84—184 **33 Claims**



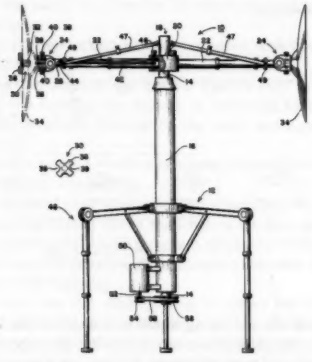
1. A piano plate assembly comprising: composite material bars, composite material plate elements and fastenings means, said bars and plate elements being selectively fastened together by said fastening means to form said plate assembly.

4,510,838

CYMBAL STAND WITH ROTATING HEAD

Raoul H. Alexis, Jr., Vallejo, Calif., assignor to Keith Alexis, Davis, Calif.

Filed Jun. 6, 1983, Ser. No. 501,525
Int. Cl.³ G10D *13/06*; G10G *5/00*
U.S. Cl. 84—422 R **2 Claims**



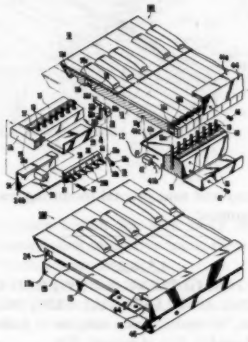
1. A cymbal support assembly, comprising a stand, a head configured to hold at least one cymbal, said head being rotatably mounted on said stand, and a motive means connected to rotate said head, said head being configured to hold a plurality of cymbals and including a plurality of arms extending radially from a vertical shaft centrally disposed on said stand, each arm being configured to hold one of the plurality of cymbals at an end remote from said shaft with a clamping means for the one cymbal, said motive means being operable to rotate the plurality of cymbals about said vertical shaft.

4,510,839

KEYBOARD STRUCTURES OF ELECTRONIC MUSICAL INSTRUMENTS

Shinji Kumano, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 24, 1981, Ser. No. 334,288
Claims priority, application Japan, Dec. 25, 1980, 55-184464
Int. Cl.³ G10C *3/12*
U.S. Cl. 84—434 **14 Claims**



1. A keyboard structure for an electronic musical instrument, said keyboard structure comprising:

a keyboard frame comprising a front rail, a back rail parallel to and spaced from said front rail, and means for interconnecting said front and back rails;

a plurality of keys juxtaposed said keyboard frame, each of said plurality of keys having a forward end portion extending across said front rail and a rearward end portion contiguous said back rail of said keyboard frame, said rearward end portion of each of said plurality of keys being pivotally interconnected with said back rail of said keyboard frame such that each of said plurality of keys is tiltable in a vertical direction about said pivotable interconnection;

a plurality of stop block members secured to said front rail such as to be located between said front and back rails, each of said plurality of stop block members further comprising a plurality of projections projecting in a first predetermined direction toward said back rail, said plurality of projections further being spaced along each of said plurality of stop block members in consecutive pairs, each of said pairs of said plurality of projections having a predetermined space therebetween;

a plurality of key return spring engaging members attached to said respective plurality of keys, each one of said plurality of key return spring engaging members being associated respectively with each one of said plurality of keys, each one of said plurality of key return spring engaging members having a subtending portion secured to said respectively associated each one of said plurality of keys, said subtending portion of each one of said plurality of key return spring engaging members further being spaced in close proximity to each of said pairs of said plurality of projections of each of said plurality of stop block members, each one of said plurality of key return spring engaging members further having a depending portion complementary with said subtending portion, said depending portion depending from said subtending portion secured to said respectively associated each one of said plurality of keys in a predetermined direction towards said plurality of stop block members;

said subtending portion of each one of said plurality of key return spring engaging members further having a forward end portion, an intermediate portion and a rearward end

portion, said forward end portion being selectively formed along a plane normal to said intermediate portion to engage said respectively associated each one of said plurality of keys, said intermediate portion being secured to said respectively associated each one of said plurality of keys, said rearward end portion being pivotally attached to said intermediate portion at a selectively predetermined angular position;

said depending portion of each of said plurality of key return spring engaging members further having an adjustable pivotable end portion defining an upper limit stop member, said upper limit stop member intimately engaging each of said plurality of stop block members between consecutive pairs of said plurality of projections spaced along each of said plurality of stop block members; said upper limit stop member being adjustable pivotally to limit the vertical tilting motion of said respectively associated each one of said plurality of keys to selectively adjust the key stroke of said respectively associated each one of said plurality of keys; and

a plurality of key return spring members, each of said plurality of key return spring members having one end interconnected with said rearward end portion of said subtending portion of each one of said plurality of key return spring engaging members; an opposite end attached neighboring a respective pair of each of said plurality of projections spaced along each of said plurality of stop block members; said opposite end of each of said plurality of key return spring members further extending into said predetermined space between each pair of projections of said plurality of projections for cooperation therewith; and an intermediate biasing portion between said one end and said opposite end, said intermediate biasing portion exerting a biasing force on said respectively associated each one of said plurality of keys to bias each of said plurality of keys away from said front rail whereby said one end of each of said key return spring members being interconnected with said rearward end portion of said subtending portion of each one of said plurality of key return spring engaging members and said adjustable pivotable end portion defining an upper limit stop member, of said depending portion of each of said plurality of key return spring engaging members being in close proximity to one another to permit quick and reliable adjustment for the key touch and key stroke for each of said plurality of keys.

4,510,840

MUSICAL NOTE DISPLAY DEVICE

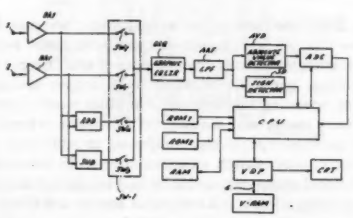
Mamoru Inami, Yokohama; Yoshiaki Tanaka, Fujisawa, and Zenju Otsuki, Tokyo, all of Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Dec. 30, 1983, Ser. No. 567,175

Claims priority, application Japan, Dec. 30, 1982, 57-232457; Jan. 13, 1983, 58-3670; Jan. 20, 1983, 58-7696; Jan. 26, 1983, 58-10994; Jan. 31, 1983, 58-14364

Int. Cl.[3] **G10G** *1/00;* **G09B** *15/02;* **G01R** *23/16*

U.S. Cl. 84—477 R **35 Claims**



1. A musical note display device for displaying musical notes, each note being indicative of a pitch of an input audio signal on a displayed staff, comprising:

(a) analog-to-digital converting means for converting said input audio signal into digital data by using sampling pulses having a sampling frequency;

(b) computing means for effecting FFT operation by using said digital data, for executing power spectrum calculation by using the result of FET operation, for determining a pitch of each sound by using spectrum data obtained by said power spectrum calculation, and determining a pattern to be displayed in accordance with each pitch;

said computing means determining the pitch by obtaining a fundamental tone by obtaining a frequency component whose level is lowest within a predetermined level range from a highest level, and whose frequency is lower than a frequency at which the level is the highest, and determining the pitch, in the case such a frequency component is not detected, by regarding the frequency component, whose level is the highest, as the fundamental tone; and

(c) display means including a video display processor, a video RAM and a display unit, said video display processor being controlled by said computing means to store data indicative of said pattern into said video RAM, and said display unit being responsive to a video signal from said video display processor for indicating musical notes displayed at appropriate position on a displayed staff.

4,510,841

MECHANISM FOR CUTTING SINGLE THICKNESS PAPER OR LIKE SHEET MATERIAL AND APPARATUS INCLUDING SUCH MECHANISM

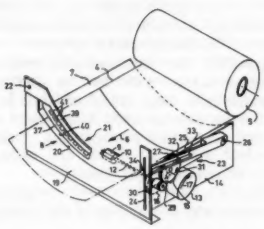
John Farran; Michael R. Hatchett, both of Eastleigh, and John S. Heath, Winchester, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1983, Ser. No. 560,083

Claims priority, application European Pat. Off., Dec. 10, 1982, 82306596.6

Int. Cl.[3] **B26D** *1/30*

U.S. Cl. 83—176 **10 Claims**



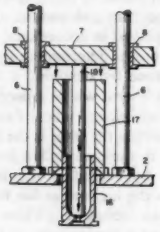
1. In a mechanism for cutting single thickness paper or like sheet material including a fixed blade and a pivoted blade, the pivoted blade having a cutting member blanked from sheet steel to a shape that provides a cutting edge that gives a desired nip angle along the length of the cut and is supported on a rigid backing member, an improvement comprising an elongated spring biasing means located between the blanked cutting member and the rigid backing member to impart a lateral force to the blanked cutting member along its length, the blanked cutting member being sufficiently flexible, and the construction and arrangement of the spring biasing means in relation to the blanked cutting member being such that the cutting edge of the cutting member is resiliently deflected towards the fixed member along its length whereby contact between the cooperating cutting edges is maintained along the length of the cut and relief between the facing surfaces of the blades is provided during cutting operations.

4,510,842

MANUALLY OPERABLE RESIZING CARTRIDGE PRESS AND METHOD FOR OPERATING SAME

Edward G. Hlusko, 5312 Marlinton Dr., Virginia Beach, Va. 23462

Filed Aug. 18, 1983, Ser. No. 524,334
Int. Cl.³ F42B *33/10, 35/02*
U.S. Cl. 86—25 **16 Claims**



11. A die press for resizing spent firearm cartridges, said press comprising:

(a) a parallelepipedic block, one end of said block having a generally cylindrical bore with a diameter greater than that of the cartridges to be resized;

(b) a back brace attached to said block adjacent to said one end of said block, said brace being angled forwardly in the direction of the end of the block opposite to said one end and upwardly from the upper surface of said block;

(c) a flat, generally rectangular plate attached to said brace above said block and substantially parallel to the upper surface of said block;

(d) two thin cylindrical guide rods bolted in substantially parallel, vertical fashion to the top surface of said block on either side thereof, equidistant from and colinear with said block bore, said rods being fastened at top ends thereof to said rectangular plate;

(e) a pressure bar comprising means for forcing a spent cartridge into and through a die, said pressure bar comprising a thin rectangular bar having one cylindrical aperture therethrough at each of its ends, reinforcing sleeves being inserted in said cylindrical apertures, said pressure bar being slidably mounted upon said guide rods which pass through said sleeves and said bar apertures;

(f) a U-shaped handle, each arm of which is fastened to an end of said rectangular pressure bar adjacent to respective ends of said arms, said arms having apertures therethrough which are closer to said arm ends than to the fastening points of said arms to said bar;

(g) connecting rods, each rod pivotably mounted to said arm apertures at one end and to sides of said block at a second end;

(h) a generally cylindrical die having a central bore with a diameter selected to produce a resized cartridge, said die adapted to be positioned on the upper surface of said block so that the bore through said die is directly above and co-axial with said block bore hole; and

(i) a cartridge extractor rod comprising means for removing the cartridge from said die after it has been resized.

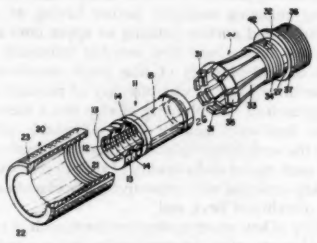
4,510,843

SOUND SUPPRESSOR ATTACHING DEVICE FOR GUNS

Robert U. Rabatin, 11181 Fairlawn Dr., Parma, Ohio 44130

Filed Aug. 24, 1983, Ser. No. 525,934
Int. Cl.³ F41C *21/18*
U.S. Cl. 89—14.4 **6 Claims**

1. A gun sound suppressor attaching device comprising a tubular connecting nipple, means for attaching said nipple to a gun barrel end, said nipple having at least one circular groove formed in one end, a generally tubular collet, means to attach said collet to a sound suppressor at one end, a plurality of elongated segments at the other end of said collet with each segment separated by a slit from each other, at least one row of lug members formed on the inward side of each segment tip for seating in said connecting nipple circular groove, said tips have a cam surface on the outward side opposite said lugs, a cylindrical tube centrally formed within said collet extending axially in alignment with said gun barrel end for sealing and



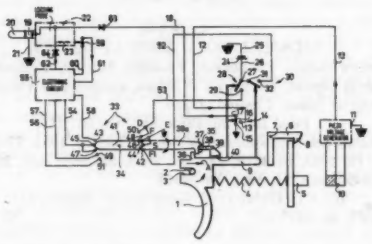
transmitting gas emission from said gun through said device, and a tubular cam locking nut for inserting around said collet, means at one end of said locking nut for locking to said collet, a cam at the other end formed on the inward side of said nut for engaging said cams on said collet segment tips for pressing said collet lug members into locking engagement with said nipple circular groove.

4,510,844

ELECTRONIC FIRING MECHANISM FOR WEAPONS

Raimund Fritz, Trossingen, and Fritz Zeyher, Alpirsbach, both of Fed. Rep. of Germany, assignors to Heckler & Koch GmbH, Oberndorf, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 422,322
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138456
Int. Cl.³ F41D *11/02*
U.S. Cl. 89—135 **15 Claims**



1. A firing mechanism for an automatic weapon having explosive charges fired by an electrical detonator receiving electrical energy for firing singular ones of said charges from a piezo voltage generator actuated by a trigger mechanism, means for operating said detonator in other modes such as at least a burst mode and a sustained fire mode wherein said charges are fired repetitively, comprising an additional source of electric energy, switch means connected to the output of said additional source actuatable by said trigger for delivery of electrical energy from said additional source and firing mode selecting means for conducting said delivered electrical energy to said detonator for the second and each successive charge to be fired in said sustained fire and burst modes.

4,510,845
PRESSURE-MEDIUM-DRIVEN LINEAR DRIVING ARRANGEMENT

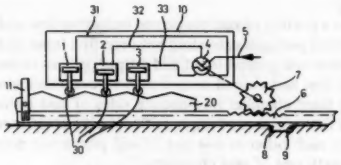
Bruno Kägi, Meilen, Switzerland, assignor to Bachofen AG, Uster, Switzerland

Filed May 28, 1982, Ser. No. 383,162

Claims priority, application Switzerland, Jun. 18, 1981, 4025/81

Int. Cl.³ F01L *33/02*

U.S. Cl. 91—180 **7 Claims**



1. A linear drive apparatus comprising:

a support member formed with a row of pressure units each having a displaceable piston and a pressurizable cylinder cooperating with the respective piston;

a rack member formed with a cam profile, said pistons being braced against said profile at respective points of attack along said row, said members being relatively displaceable linearly parallel to said rack member upon step-by-step pressurization of said cylinders and the actions of the pistons thereof in succession upon said cam profile;

valve means responsive to the relative displacement of said members for successively pressurizing said cylinders with a pressure medium to effect a step-by-step actuation of said pistons; and

a first lever pivotally connected to said support and to one of said pistons, and at least one further lever pivotally connected both to said first lever and to another of said pistons for self-centering points of attack of said piston upon said cam profile.

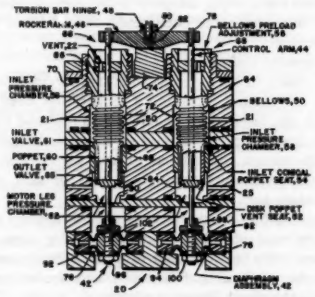
4,510,846
PNEUMATIC ACTUATOR DEVICE

Raymond W. Gazzera, Scottsdale, Ariz., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 16, 1982, Ser. No. 418,947

Int. Cl.³ F15B *17/02, 13/16*

U.S. Cl. 91—460 **9 Claims**



1. An actuator control device in combination with a pneumatic actuation system having an actuator comprising:

a housing composed of a material able to withstand high pressure and having two first voids positioned longitudinally therein with openings on the top and the bottom of said housing, said housing having one inlet port for each of said first voids communicating between the exterior of said housing and said first voids, and having one inlet/outlet port for each of said first voids communicating between the exterior of said housing and said first voids;

means for controlling the flow of high pressure gas to and from said actuator, said controlling means includes two means for valving, each of said valving means mounted in each of said first voids; each of said valving means includes an inlet valve and an outlet valve and a control arm connected to said outlet valve, said valving means provides a two-way valve capability, said control arm being adjustably secured to said interconnecting means at the top of said housing and being fixedly connected to amplifying means near the bottom of said housing; said outlet valve having a disk poppet fixedly attached to said control arm and a disk poppet set positioned on said inlet valve; said inlet valve having a cylindrical poppet with said disk poppet seat on the bottom and a conically shaped top, an inlet conical poppet set into which said conically shaped top movably contacts, a bellows having a bottom fixedly attached to the top of said cylindrical poppet, a bellow preload adjustment device having the top of said bellows attached to the bottom thereon and said adjustment device movably attached to said housing so that the amount of force applied through said adjustment device having a vent therein and having said control arm axially located therein, and a lower control arm guide attached to said housing having said control arm axially located therein;

means for movably interconnecting said valving means directly connected to said control arm of each of said outlet valves; and said outlet valves operably connected to said inlet valves, respectively, so that when one valving means is inputting high pressure gas to said actuator, the other of said valving means is venting gas from said actuator; and

said amplifying means operably connected to said control arms of said valving means for amplifying actuating forces applied to said actuator control device by a torque motor-driver assembly.

4,510,847
APPARATUS FOR ADJUSTING THE POSITION OF AN ADJUSTABLE ELEMENT

Norbert Mucheyer, Rechtenbach, and Wolfgang Kauss, Lohr-Wombach, both of Fed. Rep. of Germany, assignors to Mannesman Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 347,071

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1981, 3106086

Int. Cl.³ F15B *11/08*

U.S. Cl. 91—461 **3 Claims**

1. An apparatus for controlling the position of an adjustable member in response to a command signal and an actual value signal comprising the combination of

a source of fluid under pressure;

an operating circuit including a bidirectionally operable multi-way valve for controlling the flow of pressurized fluid to the adjustable member and first and second pressure responsive control devices for actuating said multi-way valve;

a control fluid circuit connected to operate said first and second control devices, said control circuit including

first and second adjustable throttles having the same maximum flow-through cross-sections, being adjustable in the same manner and being connected in series with each other,

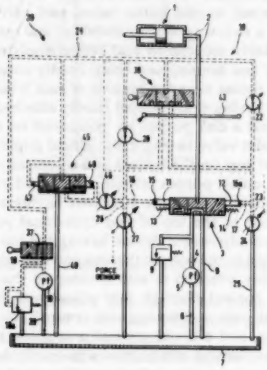
means for connecting the series circuit including said first and second throttles between said pressure source and a tank with the junction therebetween connected to said first control device,

third and fourth adjustable throttles connected in series with each other, having the same maximum flow-

through cross sections and being adjustable in the same manner,

means for connecting the series circuit including said third and fourth throttles between said pressure source and said tank with the junction between said throttles connected to said second control device;

a pressure ratio valve connected between said pressure source and said tank, said pressure ratio valve having third



and fourth control devices having pressure responsive surfaces of different sizes;

means for connecting said third control device with the smaller surface to said pressure source;

a fifth adjustable throttle; and

means for connecting said fourth control device with the larger surface through said fifth adjustable throttle to said first control device.

4,510,848

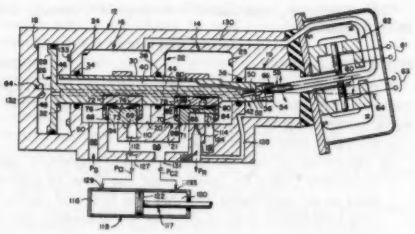
SHEAR-TYPE FAIL-FIXED SERVOVALVE

Howard B. Kast, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Sep. 30, 1982, Ser. No. 431,433

Int. Cl.³ F15B *13/043*

U.S. Cl. 91—461 **3 Claims**



1. A servovalve comprising:

a housing including a plurality of chambers, a plate, a first and a second one of said chambers being defined in part by a substantially planar surface of said plate and by chamber walls normal to said surface, said housing including a plurality of passageways, each adapted to pass fluid therethrough, a first one of said passageways communicating between said first and second chambers through a first port in each of said last-recited chambers, a second passageway communicating between said first and second chambers through a second port in each of said last-recited chambers, a third passageway communicating between a low pressure fluid sump and said first chamber through a third port in said first chamber, a fourth passageway communicating between a high pressure fluid supply and said second chamber through a third port in said second chamber;

a piston including a piston head connected to a piston rod, said piston being movable along its axis in a direction substantially parallel to said platc surface, said piston head being disposed in a third one of said chambers, said piston rod extending into each of said plurality of chambers and engaging said chamber walls in slideably sealing relationship;

at least a portion of said piston rod including first and second internal passages extending between first input and output orifices and second input and output orifices respectively, said first and second output orifices communicating with said third chamber on opposite sides of said piston head, said first and second input orifices being positioned proximate each other at one end of said piston rod disposed in a fourth one of said chambers;

a shroud extending from said one end of said piston rod within said fourth chamber;

an angularly moveable jet pipe extending into said shroud from outside said fourth chamber and terminating in a nozzle spaced from said first and second input orifices, said nozzle being adapted to direct a jet of fluid at said input orifices, said jet pipe having a null angular position in which said jet pipe assumes a predetermined offset angle with respect to said piston axis, whereby fluid is supplied in predetermined relative amounts to said first and second input orifices;

means responsive to a selectively variable control signal for changing the angular position of said jet pipe, the angular displacement of said jet pipe relative to said null position being effective to produce a magnified linear piston displacement along said axis by varying the relative amounts of fluid supplied to said first and second input orifices;

first and second shoes supported by said piston rod and disposed in said first and second chambers respectively, each shoe including a first shoe surface adapted to make sliding contact with said plate surface and a second shoe surface opposite said first shoe surface;

means for yieldingly urging said first shoe surface against said plate surface, said urging means including means for admitting pressurized fluid effective to exert a force on each of said second shoe surfaces, said urging means further including spring means interposed between said piston rod and each of said second shoe surfaces;

a plurality of ports in said plate surface, predetermined ones of said ports being adapted to be opened and closed by said shoes upon the occurrence of said linear piston displacement;

a servopiston chamber;

a servopiston movably disposed in said servopiston chamber, said servopiston including a servopiston head which divides said last-recited chamber into first and second variable chamber portions, said servopiston further including a servopiston rod affixed to said servopiston head and slidably extending through a wall of said servopiston chamber; and

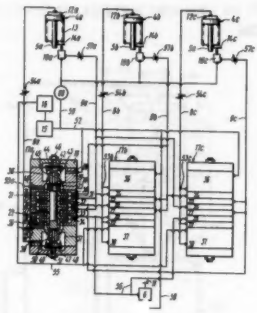
means including a pair of ports in said housing and in said servopiston chamber respectively, for communicating respectively between said first passageway and said first chamber portion and between said second passageway and said second chamber portion;

whereby said servopiston is adapted to move in a linear direction within said servopiston chamber upon the admission of pressurized fluid from said first or second passageway into one of said chamber portions simultaneously with the venting of fluid from the other chamber portion to said low pressure sump.

4,510,849
APPARATUS FOR SYNCHRONIZING ACTUATORS

Alexandr A. Khramtsov, Novocherkassky prospekt, 55, kv. 38; Mikhail I. Tsyrkin, ulitsa Oberli, 13/21, kv. 40, and Ilya E. Shinder, Bolotnaya ulitsa, 14, kv. 41, all of Leningrad, U.S.S.R.

PCT No. PCT/SU80/00176, § 371 Date Jun. 17, 1982, § 102(e) Date Jun. 17, 1982, PCT Pub. No. WO82/01572, PCT Pub. Date May 13, 1982
PCT Filed Oct. 24, 1980, Ser. No. 395,027
Int. Cl.[3] F15B *11/00*
U.S. Cl. 91—515 3 Claims

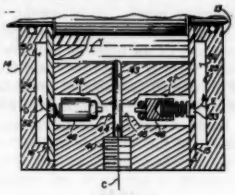


1. An apparatus for synchronizing actuators, comprising a pressure fluid source associated with a setting device adapted to set a common control action on the movement of the operating member of each actuator, said movement providing the energy medium supply to the prime or secondary movers, and also associated with transmitters of the movements of the operating members of the actuators and with a comparing device adapted to produce a control action on the actuators, said comparing device being associated with the actuators and with the transmitters and representing a multichamber adding element having a housing closed at opposite ends and accommodating a stem movable axially in opposite directions relative to its center position and secured to a plurality of diaphragms disposed within the housing, one part of said diaphragms having an effective area of each diaphragm larger than that of the other part, said diaphragms being mounted within the housing in such a manner that the diaphragms with different effective area alternate and divide the interior of the housing into positive control chambers providing the movement of the stem off center in one direction in response to the pressure build up therein, into negative control chambers providing the movement of the stem in the opposite direction in response to the pressure build up therein, an inlet chamber which connects the pressure fluid source with the actuator when the stem is moved is said one direction by the sum of the pressures in the positive control chambers exceeding the sum of the pressures in the negative control chambers, an outlet chamber connected with an inlet chamber and communicated, when the stem is moved in said opposite direction by the sum of the pressures in the negative control chambers exceeding the sum of the pressures in the positive control chambers, with a pressure fluid drain means, characterized in that it further comprises adding elements (17) of the above type and in such a quantity that the total number of the adding elements (17) is equal to the number of synchronized actuators (4), the inlet chamber (36) of each adding element (17) being communicated with one of the negative control chambers (25), (27), (29) of the same adding element (17), one of the positive control chambers (24,), (26), (28) of each adding element (17) being connected with the output of the setting device (6) and the output of the transmitter (10) of the movement of the operating member (5) of each actuator (4) being connected with such a number of negative control chambers (25), (27), (29) of the adding element (17) associated with the same actuator (4), which is one unit less than the number of synchronized actuators (4), and with one of the positive control chambers (24), (26), (28) of the rest of the adding elements (17).

4,510,850
SEAL FOR ROTARY ACTUATOR

James F. Mack, 541 N. Bertrand, Flagstaff, Ariz. 86001

Filed Nov. 22, 1982, Ser. No. 443,324
Int. Cl.[3] F01C *9/00*
U.S. Cl. 92—125 2 Claims

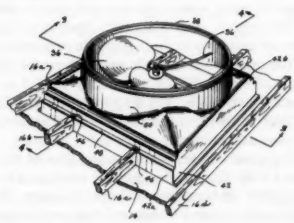


1. A rotary actuator comprising
(a) a housing having an inner actuator chamber including a pair of side walls;
(b) a pair of seals each fixedly positioned adjacent at least a portion of one of said side walls and having a generally planar surface area facing the interior of said actuator chamber;
(c) a wingshaft rotatably carried inside said housing and having
a hub rotatably contacting said housing, and
at least one vane extending radially from said hub,
said vane and hub rotating between at least a first and second operative position during operation of said actuator, said vane having a pair of end walls each contacting and moving over said planar surface area of one of said seals during rotation of said vane from said first to said second operative position; and,
(d) means for forcing said seals away from said side wall of said housing and against said end walls of said vane.

4,510,851
VENTILATION FAN

Joseph R. Sarnosky, Fort Atkinson; David W. Wolbrink, Hartford, and Dieter W. Otte, Rubicon, all of Wis., assignors to Broan Mfg. Co., Inc., Hartford, Wis.

Continuation of Ser. No. 324,459, Nov. 24, 1981, abandoned.
This application Mar. 5, 1984, Ser. No. 584,307
Int. Cl.[3] F24F *7/06*
U.S. Cl. 98—42.08 7 Claims



1. A ventilation fan structure positionable across an opening in a building member, said opening having parallel structural elements extending thereacross, said fan structure comprising:
mounting member means mountable on said structural elements in the opening therein;

rotary drive means fastened to said mounting member means;

rotatable axial flow fan blade means drivingly coupled to said rotary drive means and positionable in alignment with the building member opening for moving air through the opening; and

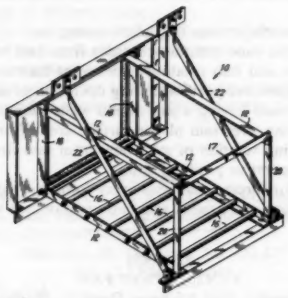
shroud means separate and unconnected from said mounting member means, drive means, and fan blade means, said shroud means being affixable to the building member independently of said mounting member means, drive means, and fan blade means, said shroud means being formed to surround the building member opening and said mounting member means, drive means, and fan blade means said shroud means having a first portion mateable with the periphery of the building member opening and a second portion formed to embrace said fan blade means, said second portion of said shroud providing a generally tubular venturi-like element adjacent the plane of rotation of said fan blade means formed to enhance the aerodynamic efficiency of the fan blade means.

4,510,852

WINDOW-TYPE AIR CONDITIONER MOUNTING ASSEMBLY

Anthony A. Sorrentino, 21 Henry St., South Farmingdale, N.Y. 11735

Filed Aug. 5, 1983, Ser. No. 520,548
Int. Cl.³ F24F *5/00*
U.S. Cl. 98—94.2 **4 Claims**



1. An apparatus for mounting an air conditioner for operative disposition with respect to a moveable sash window of a room, said apparatus comprising:

elongated rail means for supporting the air conditioner and along which the air conditioner is moveable between a first, nonoperative position within the room and remote from the window to enable the window sash to be fully closed and thereby sealed against substantial ambient air leakage thereabout, and a second, operative position in which the air conditioner is disposed in projecting relation through the open window sash, said rail means comprising a plurality of elongated rails unitarily joined to define a fixed, cross-sectionally rectangular frame along and within which the air conditioner is moveable between said first and second positions;

moveable flap means on said rail means adjacent the window for contact with the sash in its open condition to define a barrier against ambient air leakage between the operatively disposed air conditioner and the open window sash;

roller means on said rail means for facilitating movement of the air conditioner between said first and second positions thereof;

stop means mounted at opposite ends along the elongation of said rail means; and

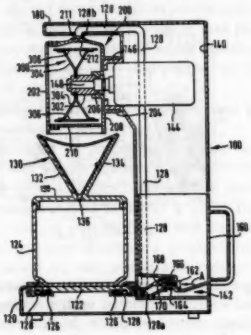
tab means predeterminately mountable on the air conditioner for cooperative engagement with said stop means to limit the maximum movement of the air conditioner along said rail means and thereby define siad first and second positions of the air conditioner.

4,510,853

COFFEE MAKING APPARATUS

Syoji Takagi, Toyoake, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 7, 1984, Ser. No. 577,815
Claims priority, application Japan, Apr. 20, 1983, 58-58937[U]; Apr. 26, 1983, 58-62814[U]; May 6, 1983, 58-68288[U]
Int. Cl.³ A47J *31/42*
U.S. Cl. 99—286 **9 Claims**



1. A coffee making apparatus comprising:

a housing;

a case, installed on said housing, for receiving coffee-beans, said case having at least a cylindrical bottom and a plurality of apertures;

an electric motor mounted on the housing, said motor having a drive shaft disposed horizontally and extending into the case;

a grinder, disposed on said drive shaft and within the case, for rotating in a vertical plane and along said cylindrical bottom of the case, said grinder crushing coffee-beans to make coffee powder said grinder comprising cutter parts disposed parallel to said bottom of the case, and arm parts arranged between each of said cutter parts and said drive shaft for securing said cutter parts;

means for providing hot water to the case, said means including a heater for heating water, said hot water and coffee powder passing through said apertures; and

means, positioned adjacent said apertures, for extracting coffee from said coffee powder by said hot water.

4,510,854

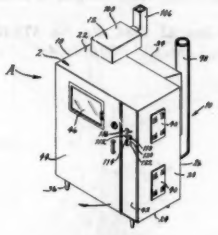
COMPACT BARBECUE OVEN

Michael L. Robertson, Marion, Ill., assignor to B. B. Robertson Company, Marion, Ill.

Filed Apr. 25, 1983, Ser. No. 488,180
Int. Cl.³ A47J *37/04*
U.S. Cl. 99—337 **15 Claims**

1. A barbecue oven comprising: a cabinet having walls and a door all provided with surfaces which enclose an oven chamber, some of the enclosing surfaces being upright and one of the upright surfaces being on the door; support means for supporting food in an upper portion of the oven chamber, the support means being accessible when the cabinet door is open, so that food may be loaded onto or removed from the support means; a firebox located in a lower portion of the oven chamber generally directly below the support means and also being accessible when the cabinet door is open, the firebox having at

least one longitudinal wall and two end walls and a door that together enclose a space in which a fire is contained, the firebox door being in the longitudinal wall and being accessible when the cabinet door is open so that a solid fuel may be loaded into the firebox, the firebox containing apertures which open into the oven chamber to enable smoke to pass from the firebox to the oven chamber, the firebox having its longitudinal and both of its end walls and its door spaced from all of the cabinet walls and from the cabinet door such that air and smoke within the oven chamber may circulate past sides, ends, top, and bottom of the firebox, the firebox further having a sleeve which extends to one of the cabinet walls, the combustion which occurs in the firebox being the sole source of heat for the oven chamber; a burner mounted on the cabinet and



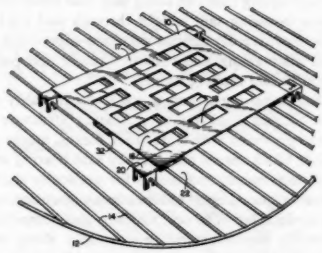
being aligned with and extended into the sleeve on the firebox, the burner being capable of producing a flame which passes into the interior of the firebox to impinge on solid fuel in the firebox; and a baffle wall located in the oven chamber between the support means and the firebox such that it shields food that is on the support means from the firebox, the baffle wall extending only partially across the oven chamber and being spaced from opposite upright surfaces of the oven chamber so that air and smoke may circulate between the upper and lower portions of the oven chamber; and a fan located in the oven chamber for moving air and smoke between the upper and lower portions of the oven chamber and past the baffle wall as it does and for further causing air and smoke to circulate past the firebox.

4,510,855

SECONDARY GRILLING APPARATUS

Correy B. Avner, 241 S. Beverly Dr., Beverly Hills, Calif. 90212

Continuation of Ser. No. 378,991, May 17, 1982, abandoned.
This application Feb. 29, 1984, Ser. No. 583,783
Int. Cl.³ A47J *37/06*
U.S. Cl. 99—450 **5 Claims**



1. A secondary grilling apparatus for use with a primary grill formed by a plurality of spaced elements, comprising:

(a) a plurality of interconnected surface having upper and lower surfaces, said surface members defining apertures therebetween wherein the apertures on each surface member define a plurality of spaced, aligned apertures formed into a predetermined pattern with the area of the surface member between apertures being approximately equal to the area thereof having apertures, the width of said apertures being substantially smaller than the space between spaced elements forming the primary grill and sufficiently narrow to permit foodstuffs having a flaked structure when cooked to be cooked on the secondary grilling apparatus without falling through the apertures;

(b) means for supporting said interconnected surface members, said supporting means being movably adjustable relative to said surface members and having a selected fixed height whereby said supporting means maintain said surface members in a selected spaced relation from the surface of the primary grill;

(c) means on said supporting means being in the form of depending prong-shaped means for engaging and resting on and receiving the elements of the primary grill therein; and

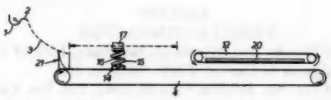
(d) a handle removably connected to the secondary grilling apparatus, including an open-ended bracket on said surface members for receiving a portion of said handle therein.

4,510,856

MANUFACTURE OF CHEDDAR AND LIKE CHEESE

Leslie A. Hammond, Beaumaris, and Norman H. Freeman, Moorabbin, both of Australia, assignors to Australian Dairy Corporation, Australia

Filed Nov. 23, 1982, Ser. No. 444,025
Claims priority, application Australia, Dec. 9, 1981, PF1885
Int. Cl.³ A01J *25/00*
U.S. Cl. 99—457 **10 Claims**



1. Apparatus for draining residual whey from a previously drained and stirred cheese curd/whey mixture, comprising a conveyor belt for conveying cheese curd in the form of a substantially continuous mat to a cutting or milling station and a weighted shear assembly means for simultaneously applying a shear force substantially in the lengthwise extending direction of the conveyor belt and a compression force, said shear assembly being spaced from and overlying a portion of the conveyor belt, said weighted shear assembly and conveyor belt being arranged such that when the curd is conveyed by the conveyor belt beneath the weighted shear assembly in use, the curd is simultaneously subjected to the compression force and the shear force as it passes between the conveyor belt and shear assembly in use to expel the residual whey and accelerate fusion and fibrous development in the curd.

4,510,857

CONTAINER RECYCLING APPARATUS HAVING SHOCK MOUNTED MANUALLY ROTATABLE CARRIER

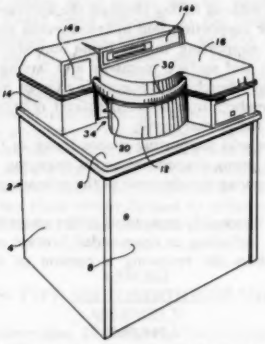
Robert L. LaBarge, Ben Avon; Frank J. Horansky, Apollo; Eric D. Arndt, New Kensington; Jerrold D. Green, Murrysville, all of Pa.; Ronald G. Hawkins, Massena, N.Y.; Charles J. Leftault, Jr., Murrysville, Pa.; Elmer E. Pohlenz, Richmond, Ind., and Thomas W. Scherf, Vandergrift, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 8, 1983, Ser. No. 559,374
Int. Cl.³ B30B *9/32*
U.S. Cl. 100—53 **23 Claims**

1. Apparatus for receiving and crushing containers consisting essentially of recyclable material comprising:

(a) an enclosure:

(b) a manually operated rotatable carrier associated with said enclosure;
(c) a first station comprising a pocket in said carrier to receive a container;
(d) means for detecting the presence of a container in said pocket;



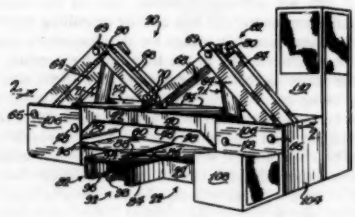
(e) shock absorbing means coupling said rotatable carrier to said apparatus to inhibit damage to the apparatus by rapid or jerking motions: and
(f) means for eventually crushing a container inserted into said carrier and transported to a crushing station by manual rotation of said carrier.

4,510,858

VEHICLE COMPACTOR

Richard E. Woods, and Marvin D. Bradburn, both of Markle, Ind., assignors to Car-Go, Corp., Muncie, Ind.

Division of Ser. No. 347,489, Feb. 10, 1982, Pat. No. 4,426,928. This application Sep. 22, 1983, Ser. No. 534,805
Int. Cl.³ B30B *9/32*
U.S. Cl. 100—35 **8 Claims**



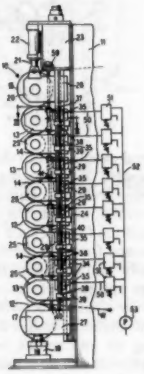
8. A method of compacting a vehicle having a length in a direction of movement of the vehicle during compaction comprising the steps of:
providing a compacting device with a frame having a bed with front and rear portions, a door movable toward and away from the bed and a winch mechanism entirely and integrally disposed on the frame adjacent the front portion of the bed and having a line with a free end;
connecting the free end of the line to the vehicle adjacent a trailing end of the vehicle;
actuating the winch to draw the line in a straight line and advance the vehicle from the rear portion toward the front portion of the bed; and
moving the door toward the bed to effect compaction of the vehicle;
whereby the entire vehicle can be drawn over the bed with the winch spaced from the front portion of the bed by a distance less than the length of the vehicle.

4,510,859

SUPERCALENDER NIP RELIEVING ARRANGEMENT

Kenneth W. Berry, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Jan. 23, 1984, Ser. No. 573,109
Int. Cl.³ B30B *3/04*
U.S. Cl. 100—35 **20 Claims**



1. A method of operating a calender having a vertical stack of a plurality of rotary rolls, each of said rolls having at each end a bearing structure with slide block means, means for guiding said slide block means and thereby said bearing structures for vertical movement, and means for vertically shifting said rolls between a spaced apart independent suspension mode and a nipping mode relation to one another, and comprising:
in said nipping mode of said rolls relieving the overhung weight of said bearing structures by imposing such weight onto load transfer means extending upwardly from a load-supporting base and along said slide block means and, thereby thrusting said weight through said load transfer means downwardly against said load-supporting base;
and thus maintaining said rolls in straight and parallel nip relation in said nipping mode.

6. A calender having a vertical stack of a plurality of rotary rolls, each of said rolls having a bearing structure at each opposite end provided with slide block means, means for guiding said slide block means and thereby said bearing structures for vertical movement, and means for vertically shifting said rolls between a spaced apart independent suspension mode and a nipping mode relation to one another, and comprising:
load transfer means extending upwardly along said slide block means and thrusting downwardly against a load supporting base;
and means carried by said slide block means for selectively imposing the overhung weight of said bearing structures to said load transfer means in said nipping mode for thereby maintaining said rolls in straight and parallel nip relation.

4,510,860

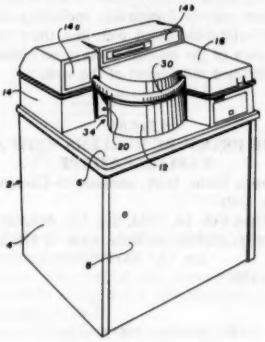
LATCHING MECHANISM FOR MANUALLY ROTATABLE CARRIER IN APPARATUS FOR PROCESSING RECYCLABLE CONTAINERS

Robert L. LaBarge, Ben Avon, Pa.; Elmer E. Pohlenz, Richmond, Ind.; Eric D. Arndt, New Kensington; Jerrold D. Green, Murrysville, both of Pa.; Ronald G. Hawkins, Massena, N.Y.; Frank J. Horansky, Apollo, Pa.; Charles J. Leftault, Jr., Murrysville, Pa., and Thomas W. Scherf, Vandergrift, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 8, 1983, Ser. No. 559,424

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—49 **25 Claims**



1. Recycling apparatus for receiving and crushing recyclable containers comprising:

(a) an enclosure;

(b) a manually operated rotatable carrier associated with said enclosure and having at least one open pocket therein for receiving a vertically oriented container;

(c) detector means for determining whether an object in said pocket is an upright container;

(d) means for locking said rotatable carrier to substantially prevent rotation thereof unless an upright container has been inserted in said pocket:

(e) means for releasing said locking means in response to actuation by said detector means when an upright container has been inserted into said pocket: and

(f) means for crushing a container after rotation of said carrier to carry a container inserted into said pocket to a crushing station.

4,510,861

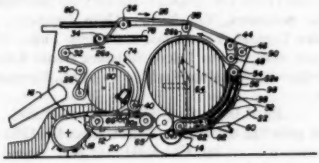
CONTINUOUS ROLL BALING MACHINE

Willis R. Campbell, Ephrata, and Allison W. Blanshine, Lancaster, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Nov. 29, 1983, Ser. No. 556,227

Int. Cl.³ B30B *5/06;* A01D *43/02*

U.S. Cl. 100—88 **12 Claims**



6. In a roll baling machine having a lower bale forming apron, a first upper bale forming apron, and a second upper bale forming apron, the improvement comprising:

said first upper bale forming apron cooperating with said lower bale forming apron to define a first bale forming chamber:

said first upper bale forming apron cooperating with said second upper bale forming means to define a second bale forming chamber therebetween; and

said first and second upper bale forming apron each including a course which is expandable in length around a roll bale during formation thereof in said second bale forming chamber.

4,510,862

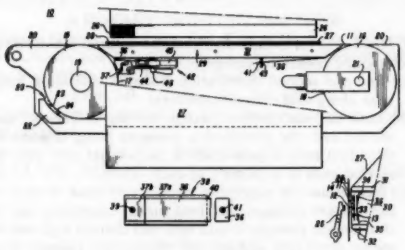
DISPOSABLE STRIP ASSEMBLY AND RETENTION DEVICE FOR A LINE PRINTER

Richard C. Alt, Vestal, and Joseph Pinter, Apalachin, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 6, 1984, Ser. No. 577,642

Int. Cl.³ B41J *1/16, 1/20*

U.S. Cl. 101—93.14 **20 Claims**



1. In a printing apparatus having rotatably mounted drive and idler pulleys with friction drive surfaces, an endless flexible metal type band being engaged and partially wrapped around said drive surfaces of said drive and idler pulleys and in tension therebetween, hammer means placed at one side of said endless type band for striking a print medium against type faces carried by said type band, and a platen placed at an opposite side of said endless type carrier between said pulleys to provide an impact surface for printing, a strip assembly for use in said printing apparatus comprising

a wear strip of plastic material removably attachable to said platen to form a barrier to reduce wear of said type band between said type band and said platen,

said wear strip having a portion with a surface in sliding contact with said opposite side of said type band whereby residue from said wear strip as well as other debris become deposited on said drive surface of said drive pulley during printing, and

a wiper strip of plastic material attached to said wear strip at an end attachable in the vicinity of said drive pulley,

said wiper strip having a wiper portion extending away from the attachment point with said wear strip and terminating in a scraping edge,

said wiper portion being sufficiently long to permit said wiper strip to be deflected outwardly from said wear strip to bring said scraper edge into continuous contact with the drive surface of said drive pulley whereby said scraper edge of said wiper strip operates to scrape deposited material from said drive surface of said drive pulley for cleaning said type band and said drive surface.

4,510,863

SYSTEM ADAPTED TO DISTRIBUTE A VISCOUS SUBSTANCE

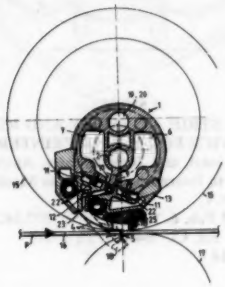
Cornelis Blaak, Boxmeer, and Gerardus H. van Mondfrans, Sambeek, both of Netherlands, assignors to Stork Brabant B.V., Netherlands

Filed Mar. 30, 1983, Ser. No. 480,396

Claims priority, application Netherlands, Apr. 8, 1982, 8201505

Int. Cl.³ B41L *13/18*

U.S. Cl. 101—119 **11 Claims**



1. Apparatus for evenly distributing a viscous substance into an elongated common passage comprising:

(a) first and second distribution passages extending lengthwise along said common passage;

(b) each said distribution passage having a first end and a second end, the distribution passages being aligned with their first ends in proximity to each other and with their second ends in proximity to each other;

(c) feed means for supplying viscous substance to each said distribution passage, said feed means supplying said first distribution passage at said first end thereof and said feed means supplying said second distribution passage at said second end thereof;

(d) each said distribution passage having an outflow opening tapered along the length of the distribution passage, the tapered outflow opening of the first distribution passage increasing from the first end to the second end thereof and the tapered outflow opening of the second distribution passage increasing from the second end to the first end thereof.

4,510,864

SCREEN PRINTING MACHINE

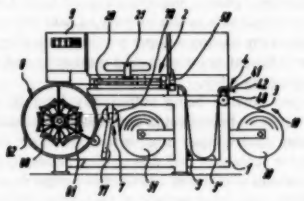
Gerhard Klemm, Am Rehwinkel 37, 4800 Bielefeld 1, Fed. Rep. of Germany

Continuation of Ser. No. 344,782, Feb. 1, 1982, abandoned. This application Jan. 31, 1984, Ser. No. 575,452

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1981, 3103421

Int. Cl.³ B41L *13/02*

U.S. Cl. 101—123 **11 Claims**



1. A screen printing machine of the type wherein a flexible web, particularly an impermeable web of paper or the like, is arranged to move forwardly and rearwardly along an elongated path, comprising a printing station having means for applying ink to one side of the web in a first portion of the path while the web moves forwardly; a driven rotary ink heating and drying device having a peripheral surface arranged to contact the other side of the web in a second portion of said path downstream of the first portion, as considered in the direction of forward movement of the web, said device having a permeable jacket and a stationary suction chamber disposed within the confines of said jacket and arranged to attract the web to said jacket along an arc of at least 90°; and means for moving the web forwardly and rearwardly to gain added printing time for repeated application of ink to the web, always while the latter moves forwardly, including rotary takeup means for collecting the dried web in a third portion of the path downstream of the second portion, as considered in the direction of forward movement of the web.

4,510,865

GRAVURE PRESSURE ROLLERS WITH AXIS OF VARIABLE SHAPE

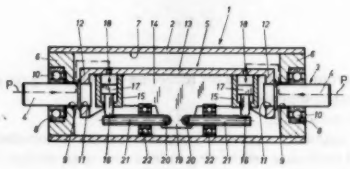
Bruno Molinatto, Turin, Italy, assignor to Componenti Grafici S.r.l., Turin, Italy

Filed Feb. 24, 1983, Ser. No. 469,526

Claims priority, application Italy, Mar. 3, 1982, 67238 A/82

Int. Cl.³ B41F *9/00*

U.S. Cl. 101—153 **14 Claims**



1. A pressure roller having a variable shape, comprising:

a central shaft having a central part;

an outer cylindrical jacket having opposite ends rotatably mounted on said central shaft and having a longitudinal axis;

actuator means, located within said outer jacket, for transmitting a deflecting force onto said axis of said outer jacket, said actuator means including a first lever pivotally coupled to said central part about a first pivot axis perpendicular to said longitudinal axis and including a first thrust means for applying pressure to said first lever in a direction radially outwardly of said outer jacket, said first lever extending substantially parallel to said shaft; and

first bearing means, between said first lever and an inner surface of said outer jacket, for transmitting radially outwardly directed forces from said first lever to said outer jacket.

4,510,866

APPARATUS FOR MEASURING THE AREA OF IMAGE PORTION OF IMAGE-BEARING MEMBER

Hidekazu Sekizawa, Yokohama; Akito Iwamoto, Kamakura; Kousaku Togashi, Yokohama, and Hideo Fujie, Shizuoka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo and Toshiba Machine Co., Ltd., Kawasaki, both of, Japan

Filed Dec. 13, 1982, Ser. No. 449,201

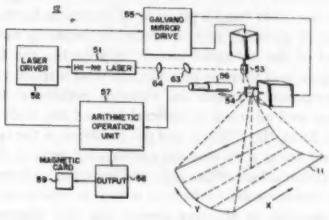
Claims priority, application Japan, Dec. 17, 1981, 56-202421

Int. Cl.³ B41F *31/04*

U.S. Cl. 101—365 **5 Claims**

1. Apparatus for measuring the area of an image portion and a non-image portion of an image-bearing bearing member

which have different reflectivities, said apparatus having a light source for emitting a light beam; scanning means for optically scanning said image-bearing member by deflecting said light beam from said light source along the X axis direction and the Y axis direction of said image-bearing member; a photoelectric converting unit for receiving light reflected from said image-bearing member and converting it to an electrical signal; and calculating means responsive to the electrical signal from said Photoelectric converting unit to calculate the area of one of the image portion and the non-image portion of said image-bearing member, wherein said scanning means comprises:



a scanning mirror for irradiating the light beam onto said image-bearing member;

a main scanner for rotating said scanning mirror to deflect the light beam along the X axis direction of said image-bearing member; and

a subscanner for holding said scanning mirror and said photoelectric converson unit in close priority to each other thereon, said subscanner being disposed rotatably so that said scanning mirror deflects the light beam from said light source along the X axis direction and the Y axis direction of said image-bearing member.

4,510,867

CONTROL SYSTEM FOR INK ZONE ADJUSTERS

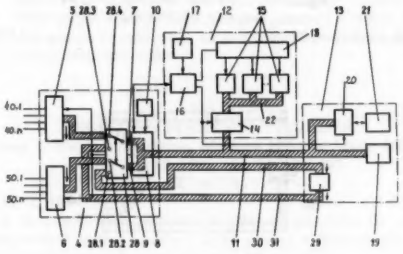
Karl-Heinz Förster, Dresden; Helmut Schuck, Coswig; Hans Johne, Radebeul, and Arndt Jentzsch, Coswig, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Dec. 7, 1983, Ser. No. 558,852

Claims priority application German Democratic Rep., Dec. 8, 1982, 245693

Int. Cl.³ B41F *31/04*; B41L *27/04*

U.S. Cl. 101—365 **1 Claim**



1. In a printing machine, a control system for ink zone adjusters including position setting motors, position sensors, operation control circuit and a main control circuit which is connected via a first bidirectional address and data bus to an input and output unit, an input terminal control connected to the position sensors, an output terminal control circuit connected to the position setting motors, an additional storage control circuit connected to said first bidirectional address and data bus and including a program control circuit cooperating with the main control circuit and with the operation control circuit, an addressing circuit controlled by the program control circuit, a processing circuit controlled by the program control circuit and connected to said first bidirectional address and data bus, a plurality of additional storing circuits assigned individually to corresponding printing units of the machine, and having their inputs connected to said addressing circuit and each being connected via a second bidirectional address and data bus and said processing unit to the first bidirectional address and data bus and therefrom to the input and output unit, the input and output unit including a semiconductive read-only memory and a parallel-connected magnetic tape memory, an improvement comprising a recording-reading storing device included in said input and output unit, and double switch having four contacts and connected to said main control circuit, the input of said recording-reading storing device being connected to a firt contact of said double switch via an input address and data bus and the output of said recording-reading storing device being connected to a third contact of the double switch via an output address and data bus, said input terminal control circuit being connected to a fourth contact of said double switch and said output terminal control circuit being connected to a second contact of said double switch.

4,510,868

CIRCUMFERENTIALLY CONTINUOUS CYLINDER FOR A ROTARY PRINTING MACHINE

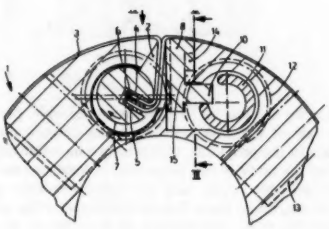
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 630,078

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326215

Int. Cl.³ B41F *7/22, 27/12*

U.S. Cl. 101—415.1 **15 Claims**



1. Circumferentially essentially continuous printing cylinder (**1, 21**) for a rotary printing machine having an axial groove (**23**) extending from the circumference thereof to permit insertion of end regions (**5, 6, 24, 25, 34, 35**) of a cover, such as a blanket (**3, 30**) or a plate (**22**), over the circumference of the cylinder,

and an axially extending filler strip (**8**) for closing the groove at the circumference of the cylinder to provide an essentially closed circumference beneath the cover after insertion of the ends of the cover in the groove,

comprising, in accordance with the invention,

a plurality of comb-like fingers (**14**) extending from the filler strip in generally circumferential direction within the groove;

a plurality of matching support fingers (**15**) projecting from the cylinder and located within the groove, the comb fingers (**14**) and the support fingers (**15**) being dimensioned and positioned to locate the circumference of the strip essentially flush with the circumference of the cylinder when the comb fingers (**14**) are located in supported position above the support fingers (**15**),

said comb fingers and support fingers being spaced from each other by a distance which is at least as great as the width of the respective fingers to permit, upon axial sliding of the filler strip, disengagement of the comb fingers from the support fingers and movement of the filler strip radially inwardly of the cylinder to a dropped or retracted position within the groove;

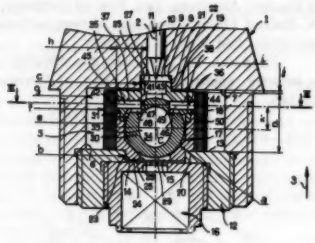
and two-part interengaging, externally operable lifting means (10, 11), one part, each, being located respectively on the filler strip and in the cylinder in the region of the groove to effect radial movement of the strip and hence of the fingers between the dropped position in which the strip is within the circumference of the cylinder, and a raised position in which the strip is essentially flush with the circumference of the cylinder, while permitting axial shifting of the strip to place the comb fingers in supported position on the support fingers within the groove.

4,510,869

ROTATING CAGE SECURITY DEVICE FOR A GYRATORY PROJECTILE

Jacques Nicolas, Riom, and Roland Raso, Vichy, both of France, assignors to Manufacture de Machines du Haut-Rhin, "Manurhin", Mulhouse, France

Filed Sep. 22, 1983, Ser. No. 534,554
Claims priority, application France, Sep. 24, 1982, 82 16097
Int. Cl.³ F42C *15/04, 15/22, 15/34*
U.S. Cl. 102—240 **6 Claims**



1. Security device for a gyratory projectile presenting a definite axis of gyration parallel to the definite direction of translation of the projectile, comprising a movable organ in the interior of the body of the projectile, at least one securing pin for such movable organ, said pin being movable, under the action of centrifugal force which accompanies the gyration of the projectile, from one position of security of the movable organ in which it cooperates with such organ to immobilize said organ in such one position of security, to a second position, of freedom of the movable organ in which such cooperation between the organ and the pin ceases,

the said organ being movable in the interior of a cage which is mounted in the body of the projectile for free rotation around the axis of gyration with respect to the body, means mounting the cage so as to permit a play of the cage with respect to the body in a direction parallel to the axis of gyration of the projectile between two abutment faces respectively before and behind the body with reference to the direction of translation of the projectile, whereby the acceleration and the deceleration to which the body is successively subjected respectively during its trajectory in the barrel of the weapon and after the exit of the weapon from the barrel puts the cage and the body respectively in relationship to the driving of the cage by the body by their conjoint gyration by friction of the cage against the rear abutment and in relation by friction of the first by the second by the gyration by friction of the cage against the forward abutment face, with a transitory period corresponding to the passing through the play by the cage during which such last is free from the gyration with respect to the body and turns around the axis of gyration at a speed of gyration which decreases less rapidly than that of the body and is superior to such speed,

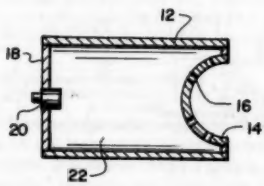
the said pin being mounted to slide radially in the cage in reference to the axis of gyration between on the one hand a position of locking in which its radially inner end more nearly approaches the axis of gyration and cooperates with the mobile organ in the interior of the cage, to immobilize such organ in said definite position with respect to the cage and in which the radially outer end of the pin, the more distant from the axis of gyration lies substantially even with the exterior peripheral face of the cage to form a cylinder of revolution around the axis of gyration, and on the other hand a position of liberation further from the axis of gyration and in which the formerly radially inner end of the pin more closely approaches the free mobile organ, and there is provided at least a spiral elastic band interposed between the external peripheral face of the cage and an inner peripheral face of the body, the mass, the form, the rigidity, and the prestress of the spiral elastic band being such that they are rolled around the external peripheral face of the cage and grip it in such manner as to be become solid by friction with it in repose and such that it sustains, in abutting against the rear abutment of the body upon the acceleration of the projectile in the barrel of the weapon, a conjoint gyration with the body with a speed ranging from the value zero to a maximum value, the spiral elastic band expanding exteriorally to become disengaged from the cage under the action of centrifugal force having a value slightly less than or equal to such maximum value in order to engage the peripheral inner face of the body and become solid with it by friction, whereby during said transitory period and when the cage engages against the forward abutment face of the body in the deceleration of the projectile outside the muzzle of the barrel of the weapon, the difference between respective speeds of gyration of the cage and the body, introduced during said transitory period, provokes a centrifugal unwinding of the spiral elastic band with the liberation of the pin or pins in the direction of a movement of unlocking of the mobile organ to a position of liberation thereof.

4,510,870

CHARGE LINER CONSTRUCTION AND METHOD

William P. Walters, Newark, Del., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 27, 1981, Ser. No. 286,744
Int. Cl.³ F42B *1/00*
U.S. Cl. 102—307 **11 Claims**



1. In the method of reducing the jet-tip velocity gradient of an exploding shaped-charge concave liner, the improvement consisting essentially of forming a plurality of holes in spaced relation around the central axis of said liner during construction of said explosive device incorporating said liner, distributing said holes at polar angles of 30 and 60 degrees and at azimuthal angles of 90 degrees to each other.

4,510,871
RAILROAD VEHICLE BOGIE

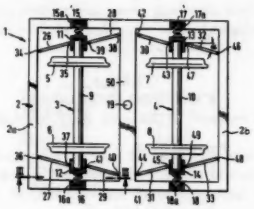
Reinhold Habeck, Eichenau; Norbert Mackiol; Franz Mautner, both of Munich, and Peter Schwärzler, Fürstenfeldbruck, all of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 7, 1982, Ser. No. 376,245

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119332; Mar. 6, 1982, 3208168

Int. Cl.³ B61F *3/08, 5/30, 5/46*

U.S. Cl. 105—167 **6 Claims**



1. A bogie for a railway vehicle, comprising:

a frame pivotally mounted on said vehicle for angular displacement about an upright pivot axis relative to said vehicle, said frame having a central bar in a vertical plane of said pivot axis and a pair of outer limbs parallel to said bar and disposed on opposite sides therein in a spaced relation to said bar;

a pair of wheel sets disposed on opposite sides of said axis in said frame between said bar and respective ones of said limbs, each of said wheel sets comprising a pair of wheels engaging respective rails of a railroad track, a shaft interconnecting said wheels, and respective bearing blocks engaging the ends of said shafts for journaling said wheel sets in said frame;

resilient means interposed between said frame and said wheel sets for enabling lateral axial displacement of said wheel sets in said frame; and

respective guide means between said frame and said wheel sets for guiding said wheel sets on said frame, each of said guide means including a trapezoidal linkage having said bar as a broad base thereof and links converging away from said bar toward said limb, said links of each trapezoidal linkage including first links pivotally connected to said bar and to the bearing blocks of the respective wheel sets and converging toward the respective limb and second links pivotally connected to the respective bearing bars and to the respective limb and converging toward said limb with the same angle of convergence of said first links, the pivots of said links to the respective bearing block being vertically offset.

4,510,872
DRAFTING EQUIPMENT HOLDER

James L. Parry, 1730 Byron, Madison Heights, Mich. 48071

Filed Jul. 15, 1982, Ser. No. 398,689

Int. Cl.³ A47B *85/00*

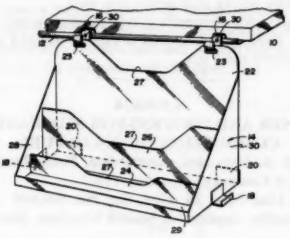
U.S. Cl. 108—25 **2 Claims**

1. A template holder for a plurality of templates for use in conjunction with a drafting table having a frontwardly oriented eraser trough, comprising;

a holder container including a back wall, a floor inclined to horizontal and slated frontwardly to provide a lean-over of all the templates in a like inclining direction and a pair of side walls;

a plurality of spaced dividers of increasing height front to back mounted intermediate said side walls substantially parallel to said back wall for providing separate open compartments for receiving and holding said inclined templates in place, each of said dividers having a liked shaped central cutout portion to facilitate the grasp of the articles carried therein; and

a mounting means for slidably mounting said holder on the forward edge of said eraser trough, said mounting means



comprising a pair of spaced s-shaped hooks each being open at both ends, the upper end of which overlaps said trough and the lower end of which extends through a mating slot formed in the rear wall of said holder.

4,510,873
STOKER TYPE FIRING EQUIPMENT FOR USE WITH CITY REFUSE INCINERATOR

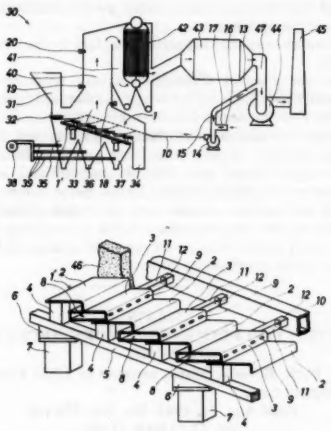
Masanobu Shigaki, Ibaraki, Japan, assignor to Kabushiki Kaisha Takuma, Osaka, Japan

Filed Mar. 19, 1984, Ser. No. 590,823

Claims priority, application Japan, Mar. 30, 1983, 58-56271

Int. Cl.³ F23G *5/00;* **F22B** *1/22*

U.S. Cl. 110—289 **1 Claim**



1. A stoker type firing apparatus for use with a city refuse incinerator comprising:

a step type stoker for receiving refuse to be incinerated, said stoker formed by combining movable fire grates which move back and forth and fixed fire grates, across which said refuse moves alternately in a step like manner, said movable fire grates sliding over said fixed fire grates to move said refuse thereacross;

gas injectors at said aforementioned fixed fire grates to inject low temperature inert gas onto refuse while burning on the stoker, said fixed grates having box shapes, being hollow, and being coupled to a source of low temperature

inert gas, wherein said fixed grates have gas injection holes at front walls thereof so that the fixed fire grates receive inert gas which is injected from said gas injection holes so that they are utilized as said gas injectors;

a dust collector for receiving and treating combustion waste gas exhausted from a waste heat boiler of said incinerator to thereby purify said waste gas; and,

a pipe system for channelling said purified waste gas to said hollow fixed grates so that it can be utilized as said low temperature inert gas.

4,510,874

BURNER AND PROCESS FOR THE PARTIAL COMBUSTION OF SOLID FUEL

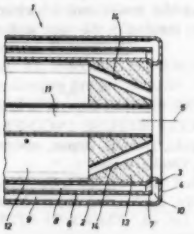
Hendrikus J. A. Hasenack, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 16, 1984, Ser. No. 590,090

Claims priority, application United Kingdom, Mar. 18, 1983, 8307519

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—347 **12 Claims**



1. A burner for the partial combustion of a finely divided solid fuel with an oxygen containing gas in a combustion zone, said burner comprising:

a central channel for supplying the fuel to the combustion zone;

an annular channel disposed coaxially with said central channel for supplying an oxygen containing gas;

a primary outlet means, said primary outlet means communicating with said annular channel and disposed to direct a high velocity oxygen containing gas flow into the fuel discharged from said central channel; and secondary outlet means, said secondary outlet means communicating with said annular channel and surrounding said primary outlet means, said secondary outlet means being disposed to supply a low velocity oxygen containing shielding gas flow to the combustion zone.

4,510,875

SYSTEM FOR PROCESSING WORKPIECES FOR SEWING

Alan M. Peck, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Aug. 31, 1983, Ser. No. 528,120

Int. Cl.³ D05B *21/00*

U.S. Cl. 112—121.12 **10 Claims**

1. A system for automatically processing a plurality of workpieces wherein each workpiece is to have one or more predefined stitch patterns sewn thereon, said system comprising:

means for automatically identifying each workpiece that is presented to the system;

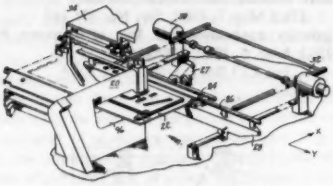
means for accessing, in a predetermined sequence, the stitch patterns that are to be sewn on the automatically identified workpiece whereby one of the stitch. patterns is accessed each time the workpiece is presented to the system; and

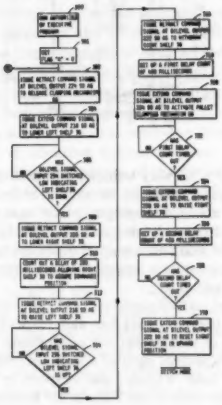
means for automatically sewing the particularly accessed stitch pattern on the workpiece.

7. A system for automatically processing a plurality of workpieces wherein each workpiece is to have one or more predefined stitch patterns sewn thereon, said system comprising:

means for automatically identifying each workpiece that is presented to the system;

means for accessing a first stitch pattern previously assigned to the workpiece in response to the automatic identification of the workpiece; and





means responsive to the accessing of the first stitch pattern for changing to a second stitch pattern previously assigned to the workpiece so as to thereby define a different stitch pattern to be accessed the next time the workpiece is presented to the system.

4,510,876

METHOD FOR POSITIONING TWO WORKPIECE PORTIONS FOR STITCHING TOGETHER ALONG A DESIRED STITCHING PATH

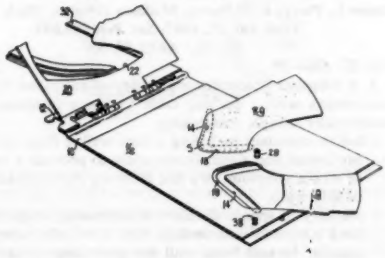
Anthony M. Garley, Oakham, and Rita A. Stafford, Birstall, both of England, assignors to USM Corporation, Farmington, Conn.

Filed Jan. 18, 1984, Ser. No. 571,721

Claims priority, application United Kingdom, Jan. 20, 1983, 8301542

Int. Cl.³ D05B *1/00*

U.S. Cl. 112—262.1 **11 Claims**



1. A method of positioning two workpiece portions for stitching together along a desired stitching path, said work-

piece portions each having a region corresponding to said stitching path, which regions do not overlap along the whole of their length when the workpiece portions are in a flat condition, the method comprising the steps of:

positioning the two workpiece portions, in a substantially flat condition, with part of said region of each thereof in an overlapping relationship;

clamping the portions so as to maintain such overlapping relationship of said parts of the regions;

distorting thereafter at least one of the workpiece portions to bring the remainder of the regions of each of the portions into overlapping relationship; and

clamping the portions so as to maintain such overlapping relationships of the remainder of said regions.

4,510,877

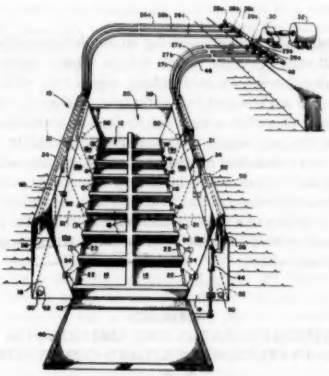
FLOATING DRY DOCK

Roger W. Bloxham, P.O. Box 8321, Newport Beach, Calif. 92660

Continuation-in-part of Ser. No. 889,454, Mar. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 847,341, Oct. 31, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,591

Int. Cl.³ B63C *1/02*

U.S. Cl. 114—45 **14 Claims**



8. A method for placing a boat into a dry dock having a hold and a flotation chamber, comprising:

submerging said dry dock by flooding said hold and said flotation chamber with water;

positioning said dry dock and said boat so that said hold directly underlies said boat;

evacuating the water from said flotation chamber exteriorly by pumping air into said chamber;

drawing water from said hold into said chamber by pumping air out of said chamber; and

evacuating the water from said chamber exteriorly by pumping air into said chamber.

4,510,878

VOLUME-ADJUSTABLE DIVERS LIFT BAG

James W. Breedlove, 424 E. Pine #5, Santa Ana, Calif. 92701

Filed Sep. 27, 1983, Ser. No. 536,301

Int. Cl.³ B63B *21/52*

U.S. Cl. 114—54 **5 Claims**

1. A device for lifting objects from the floor of a body of water to the surface with a constant preset lifting force, comprising;

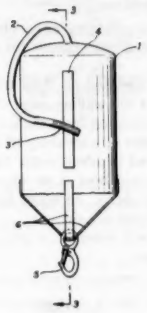
an inverted bag of substantially gas-tight material, and

a plurality of first components of a hose attachment means distributed along the height dimension of said bag and fixed to the outer surface thereof, and

a hose one end of which is communicably attached to the closed end of said bag, and

a second component of the hose attachment means fixed to the side of said hose adjacent the other end, said second component being capable of engaging said first component to create the hose attachment means, and

cargo attachment means fastened to said bag at two or more points on the periphery of the open end,



whereby the object to be lifted may be secured to said cargo attachment means, said inverted bag filled with gas, and said second component of the hose attachment means engaged successively with the plurality of first components of the hose attachment means, starting with the lowest first component and proceeding until the desired lifting force is obtained, whereupon when released the device will lift the object to the surface with the desired lifting force while spilling excess gas through said hose.

4,510,879

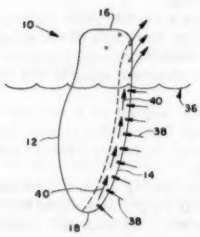
ANTI-CAVITATION RUDDER BLADE

Richard T. Weaver, 6881 Circle Creek Dr., Pinellas Park, Fla. 33565, and Gregory A. Weaver, 136 Arlington Ave., Oldsmar, Fla. 33557

Filed Sep. 28, 1982, Ser. No. 425,320

Int. Cl.³ B63H *25/38*

U.S. Cl. 114—162 **3 Claims**



1. An apparatus for steering a boat through water, comprising,

a rudder means,

said rudder means operatively mounted to said boat and operable to steer said boat,

said operatively mounted rudder means having an upper portion and a lower portion,

the upper portion of said rudder means being disposed generally out of contact with said water when said boat is under way,

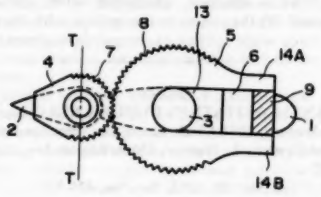
the lower portion of said rudder means being generally submerged within said water when said boat is under way,
said rudder means provided with passive maneuverability enhancing means operated by passage of the boat through water,
said rudder means provided with a hollow interior,
said passive maneuverability enhancing means including means to allow water to gain entrance into the interior of said rudder means, below the water line, when said boat is under way and to allow said water to be discharged, subsequent to said entrance, from said rudder means above the water line,
said passive maneuverability enhancing means including a vertically disposed bore means formed interiorly of said rudder means,
said bore means disposed in fluid communication with a major portion of the trailing edge of said rudder means,
said bore means extending from the lower end of said rudder means to a position downwardly of the upper end thereof,
said bore configured to admit water thereinto on a continuous basis when said boat is under way and to discharge water therefrom above the water line to thereby enhance the maneuverability of said boat,
said discharge of said water imparting a center line thrust to the rudder means.

4,510,880

RUDDER ARRANGEMENT FOR SHIPS

Sadatomo Kuribayashi, 21-22,2-chome, Kakinokizaka, Tokyo 152, Japan

Filed Mar. 10, 1983, Ser. No. 473,789
Claims priority, application Japan, Mar. 24, 1982, 57-46208
Int. Cl.³ B63H *25/38*
U.S. Cl. 114—162 **4 Claims**



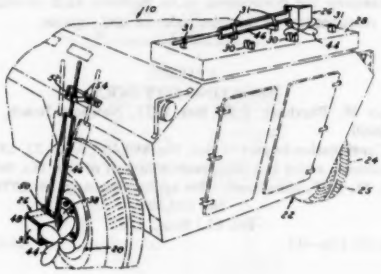
1. A rudder arrangement adapted to be mounted on the hull of a ship comprising:
a rudder having a top end and a trailing edge,
a shaft depending from the hull and being connected to said rudder for rotatably driving the same,
a flap member disposed adjacent the trailing edge of said rudder,
pivot pin means aligned on a vertical axis and pivotably mounting said flap member on said rudder,
a support member depending from the hull in spaced relation to said shaft,
a guide member having a generally U-shaped defined by a pair of spaced leg portions joined by an arcuate section,
said shaft extending through said guide member between said leg portions and adjacent said arcuate section,
said guide member being fixed to said support member in engagement with said leg portions whereby said guide member is rendered stationary,
a plurality of drive teeth on the periphery of the arcuate section of said guide member,
a sector member fixedly mounted on a top portion of said flap member for unitary movement therebetween,
said sector member having a semi-circular periphery facing the periphery of the arcuate section of said guide member, and
interconnecting means between said semi-circular periphery and the teeth on said arcuate section to cause actuation of said flap member.

4,510,881

MARINE PROPULSION UNIT

John D. Gill, Edgewater, Md., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Aug. 1, 1983, Ser. No. 519,426
Int. Cl.³ B63B *35/00*
U.S. Cl. 114—270 **8 Claims**



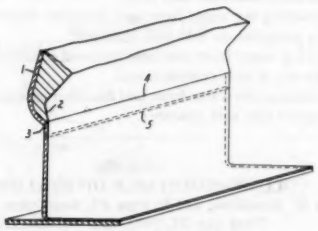
1. A marine propulsion unit for an amphibious vehicle having a hull and a pair of motor driven wheels comprising: a wheel hub extension on each wheel, a gear box with an input connected to each wheel hub extension, said gear box having an outboard propeller connected to face in a direction to enhance marine propulsion, and anti-torque means to hold the gear box and connected propeller in a desired propulsion location, said anti-torque means including a gear box stabilization strut connected between the gear box and the vehicle hull to hold the gear box in a fixed relationship to locate the propeller in a desired outboard marine drive position with respect to the motor driven wheels.

4,510,882

COATING APPARATUS AND METHOD FOR THE CURTAIN COATING OF LIQUID COMPOSITIONS USING IT

Pietro Prato, Carcare, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 3, 1983, Ser. No. 538,227
Claims priority, application Italy, Oct. 6, 1982, 65212 A/82
Int. Cl.³ B05C *5/00*
U.S. Cl. 118—300 **7 Claims**



1. An improved coating apparatus for use in curtain coating including a feeding body, a slide body determining a front surface for the sliding of the coating composition associated with it and a lip body where such composition leaves the apparatus along a negative slide surface, the improvement

consisting of having such negative slide surface associated with a negative non-slide surface of said lip body.

4,510,883

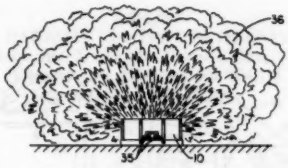
APPARATUS FOR DISTRIBUTING POWDERED MATERIAL

Donald C. Estes, Winchester, Ky., assignor to Speedco, Incorporated, Lexington, Ky.

Filed Jan. 3, 1984, Ser. No. 567,652

Int. Cl.³ B05B 1/02

U.S. Cl. 118—305 **21 Claims**



1. Apparatus for discharging powdered mineral material in a generally vertical pattern, including a hopper for a supply of powdered mineral material, conveyor means in the base of said hopper, means for entraining said material in a stream of air, rotatable impeller means for discharging the entrained material, means for rotating said impeller means, said impeller means comprising a pair of contra-rotating, side-by-side blade assemblies, each blade assembly having a plurality of blades each inclined rearwardly from a radius of the axis relative to the direction of rotation, the tip of each blade being bent forwardly relative to the direction of rotation, a cylindrical housing surrounding each said blade assembly with clearance around a major portion of the circumference of each said blade assembly, said housing projecting beyond said blade assembly toward said conveyor means, an arcuate opening in each said housing subtending an arc of about 120°, said arcuate openings being oppositely disposed with respect to one another and having an upper edge positioned about 30° before top dead center with respect to the direction of rotation of each said blade assembly, and a substantially planar, generally vertical panel on which said blade assemblies and housings are mounted so as to project toward said hopper and conveyor means, said panel extending outwardly in all directions beyond said blade assemblies and housings, whereby said entrained material is impelled outwardly by said rotating blade assemblies and distributed uniformly by said arcuate openings and said panel in a generally vertical plane laterally and upwardly throughout an arc of about 180°.

4,510,884

DEVICE FOR PROVIDING A DUAL COATING ON AN OPTICAL FIBER

Nathan B. Rosebrooks, West Thompson, Conn., assignor to ITT Corporation, New York, N.Y.

Filed Apr. 18, 1983, Ser. No. 485,700

Int. Cl.³ B05C 3/172

U.S. Cl. 118—405 **6 Claims**

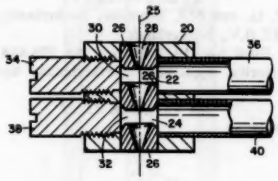
1. A device for coating optical fibers with at least two coatings, said device comprising:

a holding block having an outer surface with first and second ends, and having an inner surface defining a channel extending from the first end to the second end, said channel having an axis extending from the first end to the second end; and

at least first, second, and third coating dies arranged in the channel in the holding block, said first and second coating dies being axially separated in the channel by a first resin chamber, said second and third coating dies being axially separated in the channel by a second resin chamber;

characterized in that:

the holding block is further provided with a first passage providing fluid communication between the first resin chamber and the outer surface of the holding block, and a second passage providing fluid communication between the second resin chamber and the outer surface of the holding block;



each coating die has a first end and a second end;

each coating die is press fit into the channel in the holding block with its first end disposed toward the first end of the holding block; and

the second end of each coating die which is adjacent to a resin chamber has a substantially planar end face and is substantially perpendicular to the channel axis.

4,510,885

APPARATUS FOR APPLYING ATOMIZED LIQUID PLASTICIZER TO A RUNNING TOW OF FILAMENTARY FILTER MATERIAL

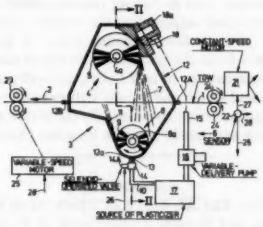
Heinz Greve, Hamburg, and Günter Wahle, Reinbek, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 25,040, Mar. 29, 1979, abandoned. This application Aug. 12, 1980, Ser. No. 177,406

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1978, 2814681

Int. Cl.³ B05B 9/00

U.S. Cl. 118—674 **6 Claims**



1. Apparatus for applying droplets of liquid plasticizer to successive increments of a foraminous tow of filamentary material, comprising means for transporting the tow lengthwise along a substantially horizontal path; a source of liquid plasticizer; means for supplying plasticizer from said source to one side of said path; first means for propelling droplets of the thus supplied plasticizer against successive increments of the running tow at said one side of said path whereby certain droplets adhere to the filamentary material and the remaining droplets penetrate through the running tow to the other side of said path, said first propelling means being located at a level above said path; means for intercepting said remaining droplets; and second means for propelling, exclusively, at least some of said remaining droplets against the running tow at said other side of said path so that the plasticizer which contacts the tow at said other side of said path consists solely of plasticizer

which has penetrated through the tow from said one side of said path, said second propelling means comprising a rotary brush and said intercepting means including a trough-shaped portion partially surrounding said brush.

4,510,886

DEVICE FOR EMPTYING A CONTAINER FILLED WITH LIVE POULTRY

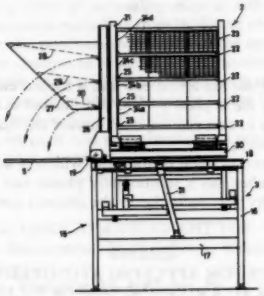
Martinus P. G. van Mil, Boxmeer, Netherlands, assignor to Stork PMT B.V., Netherlands

Filed Apr. 10, 1984, Ser. No. 598,816

Claims priority, application Netherlands, Apr. 18, 1983, 8301348

Int. Cl.³ A01K *31/07*

U.S. Cl. 119—82 **4 Claims**



1. A device for depositing live poultry onto a horizontal receiving surface comprising a container of live poultry having a plurality of vertically spaced horizontal floors and having hinged unloading doors adjacent to said floors at an unloading side of said container, means forming a pivotal support for the container whereby the container can be swung from a level poultry retaining position to a tilted poultry unloading position with relation to said receiving surface, and a poultry unloading chute connected with said means adjacent to said unloading side of the container and including poultry guide surface elements within the chute adjacent to the respective floors of the container, the guide surface elements being of progressively increasing lengths from the bottom to the top of said chute and constituting continuations of said floors, whereby tilting of the container with said chute and means will deposit poultry onto said receiving surface over substantially the entire width of the receiving surface and not in a single location thereon.

4,510,887

ANIMAL FECAL COLLECTION SYSTEM

Kay L. Lincoln, and Ricardo Ochoa, both of Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 11, 1983, Ser. No. 522,433

Int. Cl.³ A01K *23/00*

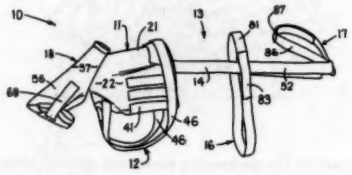
U.S. Cl. 119—95 **16 Claims**

1. A fecal collection system for attachment to a four-legged animal, comprising:

supporter means adapted to be positioned on and conformed to the hips of the animal, said supporter means being constructed of a sheetlike flexible material having a center portion which is positioned closely adjacent but rearwardly of the hips, said supporter means also including right and left portions which are joined to the center portion and extend forwardly therefrom so as to respectively wrap around the right and left hips of the animal, said right and left portions also extending upwardly across the animal's back in the vicinity of the rear legs, said center portion having opening means formed therein for permitting a colostomy bag attached to the rear of the animal to extend therethrough so as to be positionable adjacent the outer face of said supporter means;

leg strap means attached to said supporter means for assisting in holding said supporter means in contoured engagement with said animal, said leg strap means including a pair of leg straps which have one end thereof attached to said center portion with said leg straps projecting forwardly between the rear legs and then upwardly adjacent the opposite outer sides of the animal's body for engagement with the right and left portions of said supporter means; and

enclosure means attached to said supporter means and positioned rearwardly from the outer face thereof for enclosing the colostomy bag, said enclosure means being constructed of a sheetlike flexible material which assumes a substantially flat condition when the enclosure means is in an open position, said enclosure means having a portion thereof fixedly attached to said supporter means, said enclosure means being movable between said open position providing access to said colostomy bag and a closed position wherein the enclosure means defines a pocket for enclosing and supporting said colostomy bag, said enclosure means having releasable fastener means associated therewith for holding the enclosure means in said closed position but permitting opening of the enclosure means when access to the colostomy bag is desired.



4,510,888

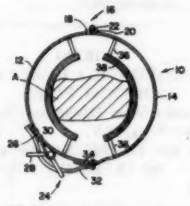
SHIELD ASSEMBLY FOR AN AREA OF AN ANIMAL TO BE PROTECTED

Barbara DeAngelis, 1218 80th St., Brooklyn, N.N.Y. 11228; Howard Jacobsen, 190 72nd St., and Edwin Jacobsen, 4 Bayridge Pl., both of Brooklyn, N.Y. 11209

Filed Dec. 23, 1981, Ser. No. 333,648

Int. Cl.³ B68C *5/00*; A01K *29/00*; A61F *13/00*

U.S. Cl. 119—143 **8 Claims**



1. A protective shield assembly for positioning on a limb of an animal about an area to be protected from access by the animal to such area, which comprises:

elongated sleeve member means including an inner surface wherein said sleeve member means are mounted to one another which when applied to said limb of said animal define a chamber in a closed position;

arm member means positioned and secured to said inner surface of at least one of said sleeve member having arm

means extending radially inwardly into said chamber and including are shaped means for contacting said limb of said animal; and

means for securing said elongated sleeve member means to one another about said limb of said animal proximate said area to be protected, said elongated sleeve member means being in spaced apart relationship to said area to be protected of said limb of said animal within said chamber thereby defining an opened zone between said elongated sleeve member means and said area to be protected to prevent animal access to the area to be protected and allow for healing of a wound in said protected area.

4,510,889

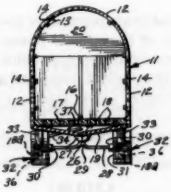
PARASITE CONTROL BATH UNIT

A. Louise Jobe, Rte. 2, Box 116, Guymon, Okla. 73942

Filed Apr. 26, 1984, Ser. No. 604,176

Int. Cl.³ A01K *13/00*

U.S. Cl. 119—159 **1 Claim**



1. A parasite control bath unit, comprising, in combination, an elongated housing including a pair of opposite side walls, an upwardly rounded roof, and horizontal floor, a pair of adjacent hinged gates at each opposite end of said housing, for admitting and exiting a plurality of cattle, and a partial end wall between said roof and an upper edge of each said pair of adjacent gates; a sub-floor of "V"-shaped transverse configuration under said floor, and opposite end walls between said floor and said sub-floor defining a chamber therebetween; a pair of longitudinally extending runners in spaced relation below said sub-floor, and a plurality of posts between said runners and said sub-floor, for supporting said housing thereupon; and a chemical spraying system on said unit, for controlling parasites on said cattle, said spraying system comprising chemical storage tanks inside said runners, a plurality of spray openings in said side walls, said roof and said floor, spray nozzles in said spray openings for spraying said cattle when inside said housing, a plurality of hose lines between said tanks and said nozzles, pump means along said hose lines moving a parasite control chemical from said tanks to said nozzles; a plurality of drain holes through said floor for sprayed said chemical draining down into said chamber, and drain hoses from said chamber to said tanks.

4,510,890

INFRARED WATER HEATER

Edwin J. Cowan, 22 Swift Ct., Newport Beach, Calif. 92663

Filed Apr. 11, 1983, Ser. No. 484,097

Int. Cl.³ F22B *5/00*

U.S. Cl. 122—17 **3 Claims**

1. Fluid heater comprising:

a tank adapted to hold fluid to be heated;

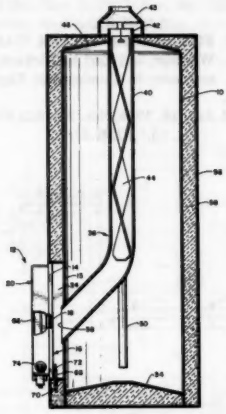
an infrared burner mounted at the side of said tank and comprising:

a housing having a permeable, vertical, interior panel dividing the interior of said housing into a combustion chamber means and a mixing chamber means, said combustion chamber means being between said panel and said tank, the face of said panel contiguous to said combustion chamber means constituting a radiating surface facing said tank,

burnable gas input means communicating with said mixing chamber means, for supplying burnable gas to said burner,

air input means for admitting primary ambient air to said mixing chamber means,

whereby gas and air pass from said mixing chamber means into said combustion chamber means, and are ignited and burn therein, thereby heating said radiating surface;



flue means communicating at one end with said combustion chamber means, thence extending upward in heat exchange relation with fluid in said tank, and exiting at the top of said tank.

4,510,891

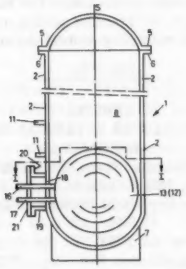
LIQUID BOILER, PARTICULARLY UTILITY-WATER BOILER

Max Bindl, Wernberger Strasse 41, D-8473 Pfreimd, and Heinz Reusch, Lerchenstrasse 4a, D-8450 Amberg, both of Fed. Rep. of Germany

Filed Jan. 4, 1984, Ser. No. 567,962

Int. Cl.³ F22B *1/02*

U.S. Cl. 122—32 **5 Claims**



1. A liquid boiler, particularly a utility-water boiler, comprising a tank whose inner space is closed by a cylindrical circumferential wall having a vertical axis, by a cover and by a convexly outwardly curved bottom and which has connections extending into the inner space for the feeding and removal of the liquid, and at least one heat exchanger forming at least one closed conduit for a heat-carrier fluid, said heat exchanger being arranged in said inner space of the tank and formed by at least one planar pipe coil of spiral or meandering, non-helical, development, the turns of which lie in a single plane said plane being parallel to or in the direction of the axis of said cylindrical circumferential wall, at least one connection

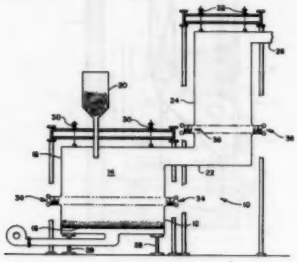
socket being provided on said cylindrical circumferential wall, said socket being closed by a plate at the end thereof protruding from the outer surface of said cylindrical circumferential wall, and the forward and return runs of said at least one heat exchanger extending in sealed fashion through said plate.

4,510,892

SEAL FOR BOILER WATER WALL

Steven P. Wincze, Windsor, and Earl K. Rickard, East Granby, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 18, 1984, Ser. No. 621,973
Int. Cl.³ F22B *37/24*
U.S. Cl. 122—510 **5 Claims**



1. In combination, a boiler including a furnace having four enclosing sidewalls, a roof, and a perforated floor, means for introducing combustible material onto the perforated floor to be burned thereon, opening means in one of the sidewalls through which combustion gases can be exhausted from the furnace, first means for supporting a first section including the furnace floor and the lower portion of the sidewalls from the bottom, second means for supporting a second section including the upper portion of the sidewalls from the top, seal means located between the first and second sections for preventing the furnace interior from being exposed to the atmosphere when the two sections are subjected to thermal growth, said seal comprising a fluid cooling trough connected to the first section, the trough being filled with granular sealing material, and a fluid cooled plate connected to the second section and extending down into the granular sealing material, both the trough and the plate extending around the entire periphery of the furnace.

4,510,893

COOLING CIRCUIT FOR INTERNAL COMBUSTION ENGINES

Erwin Schweiger, Dachau; Erwin Starmuehler, Munich, and Axel Temmesfeld, Bad Feilnbach, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,802
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1982, 3226508
Int. Cl.³ F01P *7/16*
U.S. Cl. 123—41.02 **28 Claims**

1. A cooling circuit for internal combustion engines, comprising

a coolant pump at an inlet to a cooling jacket of an engine,

a radiator constructed as a heat-exchanger for the transference of heat between engine coolant and surrounding air,

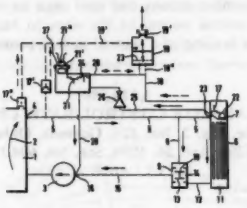
an inlet of said radiator being connected to an outlet of the cooling jacket, and a return of said radiator being connected to the suction side of the coolant pump,

a radiator valve of a thermostat arranged between the outlet of the cooling jacket and the suction side of the coolant pump in one of the inlet and return of the radiator, and

an excess-pressure valve means operable for limiting maximum pressure,

the excess-pressure valve means being controlled by the area between the cooling jacket and at least one of the radiator valve and a radiator inlet water box,

the excess-pressure valve means having an excess pressure opening value which lies above the boiling pressure of the



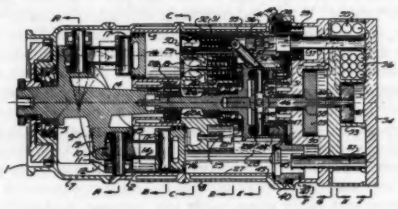
coolant, at a maximum permissive coolant temperature on the suction side of the coolant pump, by at least approximately that pressure difference which occurs between the suction side of the coolant pump and a connecting point of the excess-pressure valve means when essentially the maximum delivery output of the coolant pump occurs with a fully opened radiator valve of the thermostat.

4,510,894

CAM OPERATED ENGINE

Gerald J. Williams, R.R. #2, Nolalu, Canada

Filed Apr. 12, 1982, Ser. No. 367,244
Int. Cl.³ F02B *75/26*
U.S. Cl. 123—48 R **3 Claims**



1. In an internal combustion engine having a separate compressor for compressing an air charge to a fixed precombustion pressure, a cylinder block having a number of cylinders with a number of pistons, one piston in each cylinder, said pistons operatively connected to cause rotation of a shaft rotatably supported in said block with movement of said pistons, and a cylinder head means secured to said block to close said cylinders, said cylinder head means including cylinder heads associated with and closing each cylinder and freely moveable between a fixed end position and an adjustable end position, each cylinder head sliding within a bore of said cylinder head means to vary a volume of a combustion chamber defined between each cylinder head and the piston in said associated cylinder, each cylinder head including an admission port communicating with said cylinder and said separate compressor for admission of said air charge into said combustion chamber, an admission valve for closing of said admission port, and an admission valve mechanical actuator including a connecting means moveable with each cylinder head and in engagement with a cam actuated valve control mechanism secured in said cylinder block for opening of said admission port by movement of said admission valve determined by said cam actuated valve control mechanism, said admission valve when seated with said admission port causes said cylinder head to move to said fixed

end position due to a pressure bias created by said air charge prior entry into said cylinder and exerted on said cylinder head as said piston moves toward said cylinder head in an exhaust stroke to increase positive exhaust, said adjustable end position of said cylinder head defining a desired combustion chamber volume, said cylinder head being biased to move to said adjustable end position by said compressed charge when said admission valve is open, said fixed end position being determined by a stop face provided in said bore for engagement with a stop face provided on said cylinder head, said adjustable end position being determined by a mechanical actuator provided with a stop face for contact with a further stop face of said cylinder head, said mechanical actuator adjusting the position of the stop face thereof which determines said desired combustion chamber volume, the power output of said engine being controlled by controlling said mechanical actuator by means of adjusting said combustion chamber volume.

4,510,895

PISTONS FOR INTERNAL COMBUSTION ENGINES

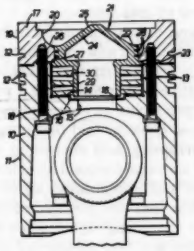
Roger H. Slee, Warwick, England, assignor to AE PLC, London, England

Filed Sep. 9, 1983, Ser. No. 530,683

Claims priority, application United Kingdom, Sep. 11, 1982, 8225967

Int. Cl.³ F02B 9/10

U.S. Cl. 123—48 B **6 Claims**



1. A Diesel engine piston comprising:

a crown,

a combustion bowl provided in said crown,

a radially inner annular surface extending around the crown and forming a fixed portion of said combustion bowl,

an annular bore provided in said crown and leading from a radially inner edge of said fixed portion,

a member having a generally cylindrical surface which is a sliding fit in said annular bore for movement between first and second positions,

an upper surface to said member providing a central portion of said combustion bowl inwardly of said fixed portion,

biassing means providing a biassing force on said member to bias said member towards said first position in which said fixed portion and central portion form said combustion bowl, said member being moved against said biassing force to said second position in each compression stroke of the diesel engine when the pressure in the combustion bowl reaches a predetermined level, in which second position the volume of the combustion bowl is increased, the second position being maintained until a second predetermined position is reached on each expansion stroke, when the member returns to said first position.

4,510,896

MULTI-CYLINDER COMBUSTION ENGINE INTAKE MANIFOLD

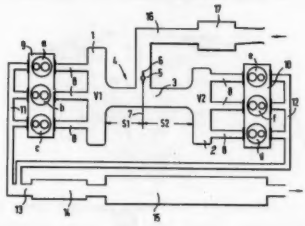
Erwin Rutschmann, Bad Hezzenalb, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.f. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 548,832

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309373

Int. Cl.³ F02B 27/00

U.S. Cl. 123—52 MB **13 Claims**



1. An air intake manifold arrangement for an internal combustion engine of the type having two similar groups of cylinders arranged spaced from one another in V-shaped relation, said manifold arrangement comprising:

first and second resonance chambers connected to one another by a straight connecting pipe at opposite ends of the straight connecting pipe, the first and second resonance chambers and the straight connecting pipe cooperating to form a H-shaped air intake manifold,

a suction connection fitting extending perpendicularly to the connecting pipe and including a single air jupply opening into the connecting pipe,

respective individual first suction pipes leading from the first resonance chamber to respective cylinders of a first group, and

respective individual second suction pipes leading from the second chamber to respective cylinders of a second group,

said first and second suction pipes extending parallel to the connecting pipe and outwardly of the respective resonance chambers at their sides opposite the connecting pipe.

4,510,897

MECHANISM FOR ACTUATING THE VALVE ROCKERS OF AN INTERNAL COMBUSTION ENGINE

Ernst Hatz, Ruhstorf, and Erich Absenger, Passau, both of Fed. Rep. of Germany, assignors to Motorenfabrik Hatz GmbH & Co. KG, Ruhstorf, Fed. Rep. of Germany

Filed Jan. 31, 1983, Ser. No. 462,298

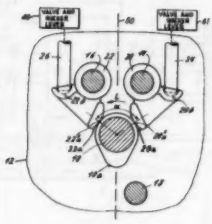
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1982, 3221134; Nov. 24, 1982, 3243509

Int. Cl.³ F01L 1/46

U.S. Cl. 123—90.48 **17 Claims**

10. A mechanism for actuating two valves of an internal combustion engine, comprising: two axially movably supported push rods; two movably supported rocker levers, each said rocker lever cooperating at one end with the associated valve and at the other end with a respective said push rod which, through its axial movement, effects movement of the associated valve; a rotatably supported shaft having a cam thereon; two pivotally supported intermediate levers, said push rods each being operatively coupled to and moved by a respective one of said intermediate levers, pivotal movement of said intermediate levers being effected by said cam on said shaft; and a first pivot pin, a second pivot pin and a third pivot pin arranged at angularly spaced locations about said control shaft and each adapted to pivotally support one of said intermediate

levers, the axis of each said pivot pin being substantially parallel to the axis of said shaft, said first and second pivot pins each being disposed approximately on one side of said shaft and being arranged symmetrically on opposite sides of a plane which contains the axis of said control shaft and which extends between said push rods, said third pivot pin being disposed on a side of said shaft opposite from said first and second pivot pins; wherein the engine is assembled in one of a first configuration and a second configuration; wherein in said first configuration said shaft rotates in a first direction, said first pivot pin pivotally supports one of said intermediate levers, and said second pivot pin pivotally supports the other of said intermediate levers, the point of engagement with said cam of said inter-



mediate lever supported on said second pivot pin being spaced a predetermined angular distance in a second direction opposite said first direction from the point of engagement with said cam of said intermediate lever supported on said first pivot pin; and wherein in said second configuration said shaft rotates in said second direction, said first pivot pin pivotally supports one of said intermediate levers, and said third pivot pin pivotally supports the other of said intermediate levers, the point of engagement with said cam of said intermediate lever supported on said third pivot pin being spaced by said predetermined angular distance in said first direction from the point of engagement with said cam of said intermediate lever supported on said first pivot pin.

4,510,898

RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE, PREFERABLY OF FOUR-CYLINDER CONSTRUCTION

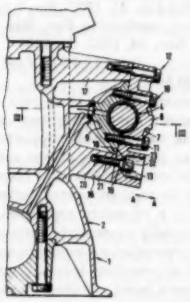
Herbert Ampferer, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.f. Porsche AG, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,372

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138165

Int. Cl.³ F16F *15/26*

U.S. Cl. 123—192 R **5 Claims**



1. A reciprocating piston internal combustion engine with a cylinder crankcase comprising at least one balancing shaft means for damping of vibration rotatably supported by a bearing housing retained relative to a cylinder crankcase by a threaded connection means, at least one part of the threaded connection means being a bolt, said bolt being a stud bolt which is connected with a bolt nut having the conically shaped neck cooperating with a corresponding chamfered area of one of the bearing housing and crankcase.

4,510,899

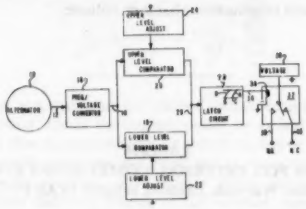
ELECTRONIC OVERSPEED SWITCH

Lawrence E. Macy, Daleville, Ind., assignor to Muncie Power Product Inc., Muncie, Ind.

Continuation of Ser. No. 75,778, Sep. 17, 1979, abandoned. This application May 1, 1984, Ser. No. 605,842

Int. Cl.³ F02P *11/00*; F02B *77/08*

U.S. Cl. 123—198 D **13 Claims**



1. An electrical speed control system for selectively connecting an accessory to an engine having a rotating electric signal producing device and a rotating shaft, said speed control system comprising:

means connected to receive a signal from said signal producing device for producing a speed signal indicative of the rotational speed of said shaft;

signal level sensing means connected to receive said speed signal for determining if said speed signal is indicative of a speed below a preselected first level and if said speed signal is indicative of a speed above a preselected second level, and for producing an energization signal whenever said speed signal is below said first preselected threshold level, for interrupting said energizing signal when said speed signal is above said second level for maintaining said interruption of said energization signal until said speed signal falls below said first preselected level and for reestablishing said energizing signal when said speed signal again falls below said first preselected level; and

switch means connected to said accessory means, and a source of electrical power, said energization signal actuating said switch whenever said energization signal is present.

4,510,900

HYDRAULIC PULSE ENGINE RETARDER

Raymond N. Quenneville, Suffield, Conn., assignor to The Jacobs Manufacturing Company, Bloomfield, Conn.

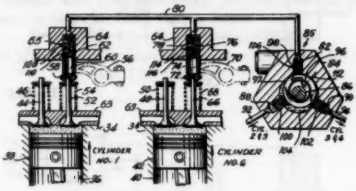
Continuation-in-part of Ser. No. 448,350, Dec. 9, 1982, abandoned. This application Jul. 9, 1984, Ser. No. 629,101

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—321 **15 Claims**

1. A compression release engine retarder for use in a multicylinder four cycle internal combustion engine having a crankshaft, intake and exhaust manifolds, intake valves, and at least one exhaust valve for each cylinder comprising a rotary hydraulic pulse generator positively driven in synchronism with said engine crankshaft, at least one slave piston operatively communicating with an exhaust valve and adapted to open said exhaust valve near the beginning of the expansion stroke of the engine cylinder with which said exhaust valve is associated when actuated by an hydraulic pulse produced by said pulse generator, duct means communicating between each said slave piston and said pulse generator to deliver said hydraulic pulse from said pulse generator to said slave piston, means to supply

hydraulic fluid to said pulse generator, control valve means communicating with each said duct means and pressure control means communicating with said duct means, said pressure control means comprising a cylinder communicating with said



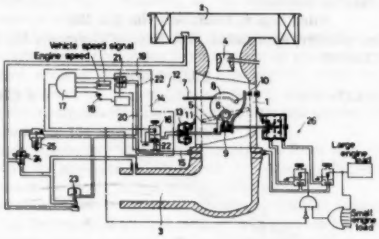
duct means, a piston mounted within said cylinder for reciprocating motion therewith and spring means biasing said piston against the hydraulic fluid pressure in said cylinder and duct means.

4,510,901

THROTTLE VALVE CONTROL APPARATUS

Fumio Yatabe, Kawagoe, and Syunzaburo Ozaki, Sakado, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,605
Claims priority, application Japan, Mar. 17, 1982, 57-41898
Int. Cl.³ F02M *3/00*
U.S. Cl. 123—325 **4 Claims**



1. A throttle valve control apparatus in an internal combustion engine having an intake passage and a throttle valve therein, said apparatus comprising:

stopper means for stopping closing movement of the throttle valve at an idling position thereof, means for removing the first stopper means at the time of deceleration from operation, thereby allowing throttle valve to move further in its closing direction beyond the idling position to a closed-valve position thereof, and a second stopper means for stopping closing movement of the throttle valve at the closed-valve position;

said means for removing including delay means for delaying the foregoing removal of the first stopper means at the time of deceleration.

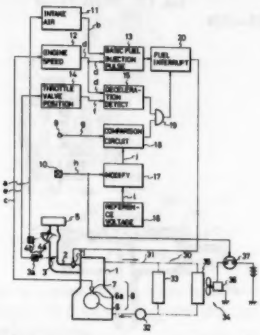
4,510,902

FUEL SUPPLY CONTROL IN DECELERATION OF AN INTERNAL COMBUSTION ENGINE FOR VEHICLES

Tsuyoshi Tsuchida, and Yoshinobu Kido, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 4, 1983, Ser. No. 481,908
Claims priority, application Japan, Apr. 6, 1982, 57-57771
Int. Cl.³ F02D *5/02*
U.S. Cl. 123—325 **5 Claims**

1. A motor vehicle including an internal combustion engine having a fuel supply system for providing a supply of fuel, deceleration detecting means for detecting that the engine is in deceleration, heating means having heat exchanging means for bringing air in the vehicle into a heat exchange relationship with an engine cooling medium so that said air in the vehicle is heated by the engine cooling medium, heater operation detecting means for detecting that the heating means is in operation,



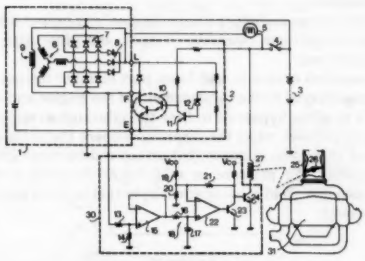
fuel supply control means responsive to outputs of said deceleration detecting means and said heater operation detecting means for interrupting the supply of fuel when the engine is in deceleration and the heating means is not in operation.

4,510,903

SYSTEM FOR REGULATING THE IDLE SPEED OF AN INTERNAL COMBUSTION ENGINE

Ryuzo Sakakiyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan and Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1983, Ser. No. 557,094
Claims priority, application Japan, Dec. 3, 1982, 57-212445
Int. Cl.³ F02D *11/10*
U.S. Cl. 123—339 **10 Claims**



1. A system for regulating the idle speed of an internal combustion engine having a throttle valve, an alternator, and a voltage regulator having a control circuit responsive to the output voltage of said alternator for controlling the current flowing through a field winding of said alternator so as to regulate the output voltage of said alternator, comprising:

means comprising an integrator for integrating the voltage across said control circuit;

means comprising a comparator for comparing the output voltage of said integrator with a reference voltage and for producing an output voltage dependent on the comparison;

means comprising a solenoid operatively connected to said throttle valve for actuating the throttle valve;

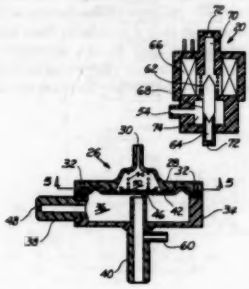
switching means responsive to said output voltage of said comparator for allowing current to pass through the solenoid and for actuating said throttle valve to regulate the idle speed, and

means comprising a resistor for providing hysteresis effect on said comparator in order to prevent hunting of the operation of said solenoid.

4,510,904
VACUUM OPERATED IDLE SPEED CONTROL DEVICE

Gary L. Casey, Troy, Mich., assignor to Allied Corporation, Morristown, N.J.

Filed Aug. 6, 1984, Ser. No. 638,188
Int. Cl.³ F02D 11/08
U.S. Cl. 123—339 4 Claims



1. A vacuum operated idle speed control device for an internal combustion engine having an intake manifold, the device for supplying bypass air around the throttle blade in the throttle body and to the intake manifold to maintain engine idle speed at the lowest engine speed, the vacuum operated idle speed control device characterized by:

a housing;

a diaphragm dividing the interior of said housing into an upper chamber for receiving control pressure and a lower chamber;

an input port member for receiving bypass air in said lower chamber;

an output port member adapted to be connected to the intake manifold;

a valve means including a valve seat on said output member, said diaphragm operable to open and close said valve means; and

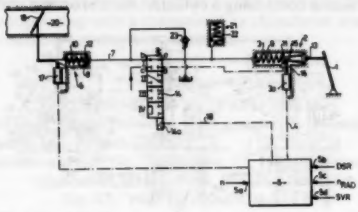
a controlled orifice in said input port member having a size proportional to the displacement of the engine and operable to allow bypass air to flow therethrough to said output port member when the diaphragm opens the valve means and to provide a controlled pressure drop thereacross to equalize the pressure in said lower chamber with the intake manifold causing said diaphragm to close said valve means.

4,510,905
SPEED CONTROL APPARATUS FOR VEHICLES

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 19, 1983, Ser. No. 515,249
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228455
Int. Cl.³ F02D 9/02
U.S. Cl. 123—360 8 Claims

1. A speed control apparatus for motor vehicles driven by internal combustion engines, having a first final control element actuatable by the vehicle driver and a second final control element engaging a fuel control means for influencing the operating status of the engine, the improvement comprising a first hydraulic adjusting cylinder for said first final control element, and a second hydraulic adjusting cylinder for said second final control element for mechanically adjusting said fuel control means, said first and second hydraulic adjusting cylinders being connected via a hydraulic connecting line, an electrohydraulic multiple-position valve having at least two switching positions being interposed into said hydraulic connecting line, and a control circuit for determining the particular switching position assumed by said multiple-position valve

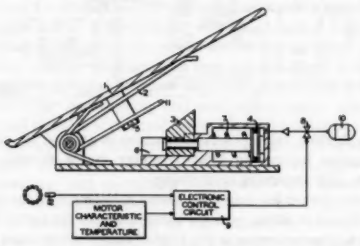


and having at least one signal derived from the operation of the engine supplied thereto.

4,510,906
ACCELERATOR PEDAL MECHANISM FOR OPTIMIZING FUEL ECONOMY

Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 8, 1983, Ser. No. 530,286
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234479
Int. Cl.³ F02D 31/00
U.S. Cl. 123—396 6 Claims



1. An accelerator control mechanism for a motor vehicle comprising:

(a) an operator's accelerator pedal movable within a range extending between a fully retracted position and a depressed position to regulate the supply of fuel to the vehicle engine;

(b) a positionable stop with which said pedal is engageable during acceleration for restraining movement of said pedal toward said depressed position, whereby a desired pedal position is established in which optimum fuel economy is attained;

(c) a spring cage fixed to said pedal;

(d) a limit spring supported between said spring cage and said pedal, said limit spring being engageable with said stop to provide said restraining of said pedal in said desired pedal position, and upon said engagement with said stop being compressible to permit further movement of said pedal beyond said desired pedal position toward said depressed position; and

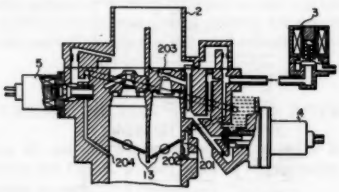
(e) means for controlling the position of said stop in accordance with different speeds of the vehicle engine.

4,510,907

ELECTRONIC CONTROL SYSTEM FOR CONTROLLING AIR-FUEL RATIO IN AN INTERNAL COMBUSTION ENGINE

Takeshi Atago, and Toshio Manaka, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 12, 1982, Ser. No. 377,420
Claims priority, application Japan, May 19, 1981, 56-74170
Int. Cl.³ F02M 7/10
U.S. Cl. 123—435 **10 Claims**



1. An electronic control system for controlling a carburetor equipped with first control means for a slow main system and second control means for an enrichment system, said first and second control means having different control ranges and respective openings which are electromagnetically controlled to control the air-fuel ratio of a mixture supplied to an internal combustion engine, said system comprising:

means for generating signals representative of the engine operating states including at least that an engine temperature is below a predetermined value;

a control unit receiving the signals representative of the engine operating states from said signal generating means and reading data regarding the air-fuel ratio required dependent on the engine operating states to generate control signals for controlling the first and second control means of the carburetor; and

means responsive to the control signals from said control unit to generate drive signals for driving the first and second control means of the carburetor;

said control unit being constructed such that the data regarding the required air-fuel ratio is compared with a predetermined value, the comparison results determining whether the first control means or the first and second control means of the carburetor control the air-fuel ratio, and the control signal necessary for controlling the corresponding control means of the carburetor is generated on the basis of the comparison result.

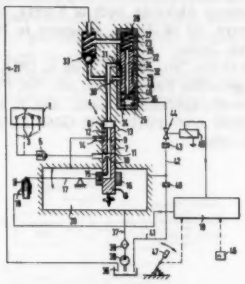
4,510,908

FUEL INJECTION PUMP

Hermann Eisele, Vaihingen-Enz, and Volkhard Stein, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 417,975
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3211877
Int. Cl.³ F02M 59/20
U.S. Cl. 123—449 **11 Claims**

1. A fuel injection pump comprising a pump piston movable in a closed chamber and a pump work chamber defined thereby, which during a pump intake stroke is supplied with fuel from a pump suction chamber filled with fuel under pressure from a pressure source and which during a pump piston supply stroke can be made to communicate with a fuel injection location, further having a device for adjusting an effective pump piston supply stroke and a relief line leading away from the pump work chamber, a throttle device disposed in a cylinder in the relief line with an end face enclosing a control chamber, which communicates via a pressure line with said pump suction chamber, wherein the pressure line includes a variable throttle therein controlled in accordance with operating parameters and made to communicate with the relief chamber via a relief line in said throttle device containing a first fixed throttle, characterized in that the variable throttle is variable by



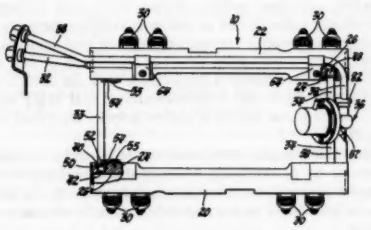
means of an electrical control unit in accordance with rpm, and a second fixed throttle is disposed between the suction chamber and the variable throttle.

4,510,909

FUEL RAIL ASSEMBLY

Thomas G. Elphick, Hilton; Edgar S. Eshleman, Holcomb, and Martin J. Field, Churchville, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1984, Ser. No. 597,080
Int. Cl.³ F02M 55/00; F02B 75/22
U.S. Cl. 123—470 **7 Claims**



7. A fuel rail assembly for an engine, said fuel rail assembly comprising a body having a fuel passage and a socket intersected by said fuel passage, said socket having a stepped bore with an outer portion of larger diameter than an inner portion, a tube having an end slidably received in said inner portion of said socket, an O-ring engaged between said tube and said outer portion of said socket, said tube further having a shoulder disposed in said outer portion of said socket for preventing displacement of said O-ring out of said outer portion of said socket, and means for permitting relative motion between said tube and said body while limiting such motion to preclude withdrawal of said tube end from said inner portion of said socket and to further preclude withdrawal of said shoulder from said outer portion of said socket, whereby said fuel body and said tube may experience relative motion without loss of fuel from said socket.

4,510,910
IGNITION TIMING CONTROL METHOD AND APPARATUS FOR INTERNAL COMBUSTION ENGINES

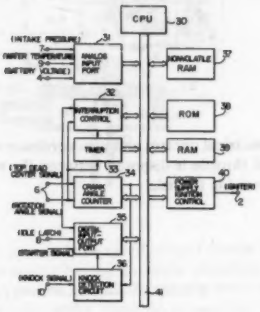
Masakazu Ninomiya, Kariya; Toshi Suda, Nagoya; Norio Omori; Susumu Akiyama, both of Kariya, and Hiroyasu Fukaya, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 289,997, Aug. 4, 1981, abandoned. This application Feb. 8, 1984, Ser. No. 578,295

Claims priority, application Japan, Aug. 8, 1980, 55-109705

Int. Cl.[3] **F02B** *3/00*; **F02D** *5/00*; **G06F** *15/20*; **F02P** *5/04*

U.S. Cl. 123—486 **6 Claims**



1. A method of controlling an ignition timing of an internal combustion engine including an ignition means and a control computer having a non-volatile memory, said control computer being connected to said ignition means, said method comprising the steps of:

detecting a first driving state of the engine to produce a first signal;

detecting a second driving state of the engine to produce a second signal indicative of a knock signal;

detecting a third driving state of the engine to produce a third signal indicative of a MBT signal;

calculating a base ignition timing value in accordance with the detection of said first signal;

correcting said base ignition timing value with a learning correction value stored in said non-volative memory;

updating the learning correction value in said non-volatile memory by determining whether correction of said ignition timing is required in accordance with the detection of said knock signal and independently of said MBT signal, said knock signal having a higher priority than said MBT signal; and

updating the learning correction value in said non-volatile memory by determining whether the correction of said ignition timing is required in accordance with the detection of said MBT signal and independently of said knock signal.

4,510,911
METHOD FOR CONTROLLING FUEL SUPPLY TO AN INTERNAL COMBUSTION ENGINE AFTER TERMINATION OF FUEL CUT

Yutaka Otobe, Shiki, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

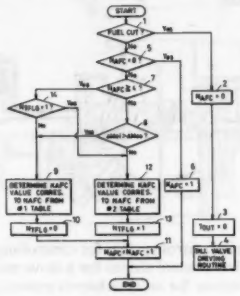
Filed Apr. 6, 1984, Ser. No. 597,792

Claims priority, application Japan, Apr. 6, 1983, 58-60565

Int. Cl.[3] **F02D** *5/02*

U.S. Cl. 123—493 **4 Claims**

1. A method of controlling the quantity of fuel being supplied to an internal combustion engine after termination of a fuel cut operation of said engine at deceleration, wherein the fuel quantity is increased to desired values, by the use of fuel increments set in synchronism with generation of pulses of a predetermined control signal which are generated at predetermined crank angle positions of said engine, the method comprising the steps of: (1) setting beforehand a plurality of groups of fuel increments as said fuel increments, which have different fuel quantity increasing characteristics from each other; (2) determining whether or not there occurs a transition of the operative state of the engine from said fuel cut operation wherein fuel supply is cut off to a normal operation wherein fuel supply is effected; (3) detecting the magnitude of change



of the rotational speed of said engine for a period of time after the occurrence of said transition has been determined and before a predetermined number of pulses of said predetermined control signal are generated; (4) selecting one of said plurality of groups of fuel increments which corresponds to the detected magnitude of change of the rotational speed of said engine; and (5) effecting said increase of the fuel quantity by the use of the selected group of fuel increments.

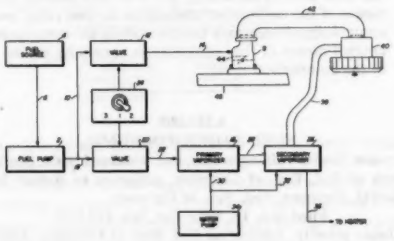
4,510,912
FUEL SYSTEM

David E. Gamble, 435 S. Stewart St., Mesa, Ariz. 85202

Filed Feb. 18, 1983, Ser. No. 467,756

Int. Cl.[3] **F02M** *31/00*

U.S. Cl. 123—525 **4 Claims**



1. In an internal combustion engine of the type which receives alcohol from a source by means of a fuel pump and of the type which has associated therewith an engine cooling system including a water pump, wherein the improvement comprises an improved fuel system including:

a primary carburetor for receiving alcohol in liquid form from said fuel pump and supplying the alcohol to the engine for combustion;

vaporizing means for vaporizing alcohol to form a vapor fuel;

selection means for selectively supplying alcohol to said primary carburetor and to said vaporizing means and for blocking the flow of alcohol to said primary carburetor and to said vaporizing means, said selection means including:

a first electrically operated solenoid valve coupled between said fuel pump and said primary carburetor;

a second electrically operated solenoid valve coupled between said fuel pump and said vaporizing means;

switch means for opening only one or neither of said first and second valves; and

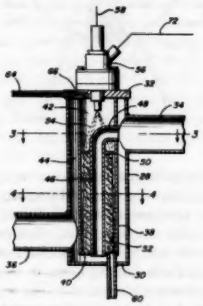
a secondary carburetor for receiving vaporized alcohol from said vaporizing means and supplying it to the air intake upstream of said primary carburetor wherein said switch means comprises a three position switch having a first position for opening only said first electrically operated solenoid valve, a second position for opening only said second electrically operated solenoid valve, and a third position for maintaining said first and second electrically operated solenoid valves closed.

4,510,913

VAPORIZING FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Charles W. deCelle, Montgomery, Ala., assignor to Ralph A. Franco and Lila K. Franco, both of Montgomery, Ala., part interest to each

Filed Mar. 20, 1984, Ser. No. 591,981
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **9 Claims**



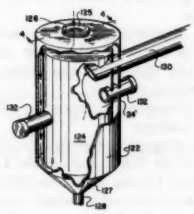
1. A vaporizing fuel system for an internal combustion engine having an intake manifold, a carburetor with a venturi and throttle valve controlling flow of a combustible mixture into the intake manifold, a plurality of vaporizing chambers, each vaporizing chamber including a fuel injector for injecting a predetermined quantity of fuel into each vaporizing chamber in a timed sequence and in a spray pattern, each vaporizing chamber including means in heat exchange relation to the exhaust products from the internal combustion engine to vaporize the fuel in the vaporizing chamber and means communicating the vaporizing chambers with the venturi for discharging vaporized fuel to the venturi with the reduced pressure in the venturi inducing flow of vaporized fuel into the venturi from the vaporizing chambers, and means responsive to airflow through the venturi and the throttle valve setting to control injection of fuel by the injectors, said means controlling injection of fuel into the vaporizing chambers including a transducer associated with the venturi for sensing airflow and throttle valve condition and a microprocessor receiving data from the transducer and providing a signal to each of injectors for operating the injectors to discharge fuel into the vaporizing chambers, each vaporizing chamber including an outer casing defined by a cylindrical outer wall closed by a bottom wall and a top wall, said means in heat exchange relation to the exhaust products including an exhaust inlet communicating with the interior of the outer wall and an exhaust outlet communicating with the interior of the outer wall to provide flow of exhaust products through the vaporizing chamber, each vaporizing chamber also including a inner casing including an inner wall spaced concentrically from the outer wall and having the lower end closed by a bottom wall spaced from the bottom wall of the outer casing and the upper end secured to the top wall forming a closure for the outer wall, the lower portion of the inner casing being filled with copper wool with a plate engaging the upper surface of the copper wool with fuel being sprayed on the plate for initial vaporization with the partially vaporized fuel then passing downwardly around the edges of the plate and through the copper wool, said inner casing being provided with a discharge tube for vaporized fuel for communication with a common manifold extending to the venturi of the carburetor.

4,510,914

APPARATUS AND METHOD FOR PREPARING A MIXTURE OF COMBUSTIBLE LIQUID FUEL AND AIR

Ben D. Purser, 6659 Alanbrook Dr., Charlotte, N.C. 28215

Filed Jul. 27, 1981, Ser. No. 287,078
Int. Cl.³ F02M *29/00*
U.S. Cl. 123—590 **11 Claims**



1. A method of preparing a mixture of a combustible liquid fuel and air for supply to an internal combustion engine, comprising the steps of:

(a) atomizing said fuel into droplets including droplets of a sufficiently small size for substantially complete combustion in said internal combustion engine and entraining said fuel droplets in a moving airstream,

(b) providing conduit means for directing said fuel entrained airstream to said engine, said conduit means including an enlarged droplet separation chamber.

(c) conveying said fuel entrained airstream through said conduit means to said engine while separating therefrom fuel droplets larger than said small size, said separation chamber of said conduit means being of a selected cross-sectional area sufficiently enlarged in relation to the remainder of said conduit means for causing said fuel entrained airstream to expand volumetrically in said chamber to reduce the velocity of said fuel entrained airstream sufficiently to allow said larger droplets to separate gravitationally therefrom and to maintain the entrainment therein of said small droplets for direction to said engine for efficient and substantially complete combustion in said engine, said conveying including withdrawing said fuel entrained airstream from said chamber at a location therewithin spaced inwardly from the walls thereof, and

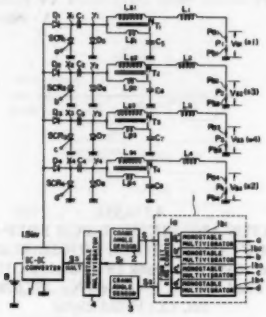
(d) collecting said separated larger fuel droplets, removing said separated larger fuel droplets from said separation chamber and recycling said larger fuel droplets by reatomizing them and entraining them in said airstream in advance of said separation chamber.

4,510,915

PLASMA IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Yasuki Ishikawa; Hiroshi Endo, both of Yokosuka; Masazumi Sone, Tokyo, and Iwao Imai, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 29, 1982, Ser. No. 428,229
Claims priority, application Japan, Oct. 5, 1981, 56-157398
Int. Cl.³ F02P *3/08*
U.S. Cl. 123—620 **7 Claims**



1. A plasma ignition system for an internal combustion engine, comprising:

(a) a plurality of plasma spark plugs each having a discharge gap between a central electrode and a grounded side electrode, said discharge gap being located in a corresponding engine cylinder;

(b) a DC-DC converter for boosting a low DC voltage into a high DC voltage;

(c) a plurality of ignition energy charging means, each having a first diode connected to said DC-DC converter, a first capacitor having a first terminal connected to said first diode and a second terminal connected to ground via a second diode, the first capacitor being charged by the high DC voltage from said DC-DC converter via a series path including said first and second diodes;

(d) a plurality of reverse blocked triode thyristors, each having an anode connected to the first terminal of said first capacitor and a grounded cathode, each thryistor being selectively turned on so as to discharge the energy stored in the said first capacitor therethrough;

(e) a plurality of voltage boosting transformers, each having a primary winding and secondary winding and a magnetic core that couples the primary and secondary windings to each other, the magnetic core having a tendency to saturate in response to current resulting from discharges of the first capacitor, first and second ends of said primary winding of each transformer being respctively connected in series with the second terminal of said first capacitor and to ground via a second capacitor having a capacitance value smaller than said first capacitor whereby a damped oscillation is generated in the second capacitor when the capacitive energy is discharged from said first capacitor through said thyristor, first and second ends of said secondary winding being respectively connected in series with the second terminal of said first capacitor and to the central electrode of the corresponding plasma spark plug, whereby the voltage applied to said corresponding primary winding is boosted and the boosted voltage is applied to the corresponding spark plug;

(f) an ignition trigger signal generator for (1) circularly generating and coupling a trigger signal to a gate of said corresponding thyristor according to a predetermined ignition order of the engine cylinders in response to the engine revolving through a predetermined angle and (2) generating and coupling another pulse signal having a predetermined pulsewidth to said DC-DC converter in synchronization with the ignition trigger signal for halting derivation of the high DC voltage for a period of time determined by said pulsewidth of the pulse signal; and

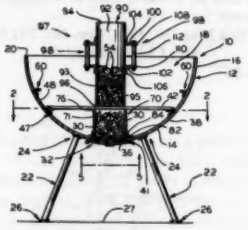
(g) a plurality of core-less inductors each connected in series with the secondary winding of said corresponding voltage boosting transformer and the electrodes for restricting an abrupt large discharge current flow through the corresponding plasma spark plug discharge gap so as to extend the ignition energy flow through said gap by the corresponding plasma ignition plug.

4,510,916

BARBEQUE GRILL WITH PAPER START FACILITY

Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

Continuation-in-part of Ser. No. 502,705, Jun. 9, 1983, abandoned. This application Jun. 4, 1984, Ser. No. 617,076
Int. Cl.³ A47J *37/07*; F24B *3/00*
U.S. Cl. 126—25 B **12 Claims**



1. In a barbeque grill that includes a receptacle of open top bowl configuration having a central portion centered on same, at a central axis that extends normally of the plane of the receptacle top, with the receptacle defining a floor that is centered on the axis, and including a charcoal support grid and means for removably mounting same in the receptacle above and in operative overlying relation to the receptacle floor, and a food cooking grid and means for removably mounting same above and in operative overlying relation to the charcoal support grid, with the grids being respectively proportioned to be substantially centered on the central axis when mounted in the receptacle in their respective operative relations, and with the grids being disposed normally of the central axis when mounted in the receptacle in their respective operative relations, and means for mounting the receptacle for cooking purposes with the central axis of the receptacle substantially vertically disposed,

the improvement wherein said grill includes:

a tinder receiver located below the level of the charcoal support grid, when the latter is in its said operative relation, and defining a tinder receiving chamber that is substantially centered on the central axis and that is proportioned transversely of said central axis to receive a tinder charge of predetermined size,

said tinder receiver defining an open upper end through which the tinder charge may be inserted into said tinder receiving chamber when the grids are removed from the receptacle for charging said tinder receiver with tinder,

said tinder receiver underlying the charcoal support grid across said tinder receiving upper end thereof when said charcoal support grid is in its operative relation,

a combination charcoal receiver and distributing device that is discrete with respect to said grill and comprises an elongate annular sleeve having an open center extending therethrough and open upper and lower end portions defining a charcoal receiving chamber that is open at the upper and lower ends of same and has a central axis extending longitudinally of said sleeve,

said charcoal receiver device lower end being formed to rest

on the charcoal support grid, when the charcoal support grid is mounted in the receptacle in its said operative relation,

said charcoal receiver device being proportioned transversely of its central axis to receive in said chamber thereof a charcoal charge that transversely of said charcoal receiver central axis approximates the corresponding dimensioning of said tinder receiver chamber,

and means for venting ambient air exterior of said receptacle into said tinder chamber for providing for igniting and supporting combustion of a tinder charge received therein,

said charcoal receiver device having a pair of oppositely disposed handles fixed to said sleeve adjacent said upper end thereof and each comprising a hand grip portion disposed externally of said sleeve for gripping by the grill user's right and left hands respectively, for shifting said receiver device lower end relative to and over the charcoal support grid,

whereby, when the grill is to be used for charcoal food cooking, and on removal of both the grids from the receptacle to expose said tinder receiving chamber upper end, the tinder charge may be applied to said tinder chamber and the charcoal grid returned to its operative relation, whereupon said charcoal receiver device may be rested on the charcoal grid in substantial vertical alignment with said tinder receiver and with said lower end portion of said charcoal receiver device engaging the charcoal grid, a charcoal charge may be applied to said charcoal receiver device chamber through said charcoal receiving chamber upper end, and the tinder charge may be ignited through said venting means to effect ignition and burning of the charcoal charge by chimney effect through said charcoal receiver device chamber,

and after the charcoal charge is ignited, the user, facing the grill, may grasp said charcoal receiver device handles with his right and left hands, respectively, to sufficiently lift same upwardly of the charcoal support grid and shift the lower end of the charcoal receiver device over the charcoal grid, for controlled discharge of the ignited charcoal from said device, and spreading of the charcoal, onto the charcoal grid, after which said charcoal receiver device is moved out of the grill and set to one side, and said cooking grid may be disposed in said operative relation thereof for food cooking purposes over the ignited charcoal.

4,510,917

PASSIVE MODE SOLID FUEL BURNING FURNACE

Paul Runquist, 1030 Neil Creek Rd., Ashland, Oreg. 97502

Continuation-in-part of Ser. No. 335,701, Dec. 30, 1981, abandoned. This application Jan. 18, 1984, Ser. No. 572,160

Int. Cl.³ F24B *5/02*

U.S. Cl. 126—76 **16 Claims**

1. A downdraft solid fuel-burning furnace comprising:

(a) a shell;

(b) a primary combustion chamber defined in said shell;

(c) means for supporting fuel in said primary combustion chamber, with at least a portion of the bottom surface of said fuel being exposed for combustion;

(d) a primary air inlet located in said primary combustion chamber;

(e) a secondary combustion chamber defined in said shell and separated from said primary combustion chamber;

(f) a throat fluidly connecting said primary combustion chamber to said secondary combustion chamber;

(g) an exhaust flue exiting from said secondary combustion chamber; and

(h) channel means for receiving and directing air flowing between said air inlet and said throat along only said bottom surface of said fuel.

9. A down draft solid fuel-burning furnace comprising:

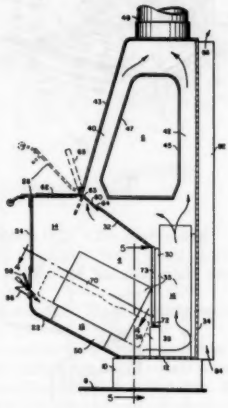
(a) a shell;

(b) a primary combustion chamber defined in said shell;

(c) said primary combustion chamber having a bottom surface which slopes downwardly, thereby forming an upper end and a lower end;

(d) a primary air inlet located in said primary combustion chamber proximate the upper end of said bottom surface;

(e) a secondary combustion chamber defined in said shell and separated from said primary combustion chamber;



(f) a throat fluidly connecting said primary combustion chamber to said secondary combustion chamber, said throat being located proximate the lower end of said bottom surfaces; and

(g) an exhaust flue exiting from said secondary combustion chamber.

4,510,918

WOODBURNING HEATING APPARATUS

Robert W. Ferguson, South Royalton; Derik K. Andors, and William W. Crossman, Jr., both of Randolph, all of Vt., assignors to Vermont Castings, Inc., Randolph, Vt.

Filed Nov. 28, 1983, Ser. No. 555,511

Int. Cl.³ F24C *1/14*

U.S. Cl. 126—79 **9 Claims**

1. Woodburning heating apparatus comprising:

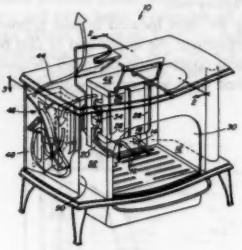
a primary combustion chamber for burning a supply of wood contained therein;

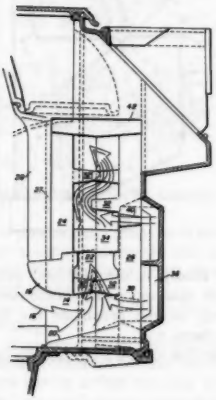
a secondary combustion chamber in gaseous communication with said primary combustion chamber;

said secondary combustion chamber being lined with a refractory material and including a perforate catalytic igniter therein through which combustion gases from said primary combustion chamber flow;

said secondary combustion chamber further including refractory baffles arranged to enhance mixing of said combustion gases and located to re-radiate heat onto said catalytic igniter; and

means for introducing secondary combustion air into said secondary combustion chamber;





whereby said combustion gases are more completely burned to improve heating efficiency and reduce emissions.

4,510,919

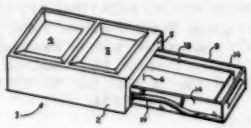
SELF HEATING RECEPTACLE

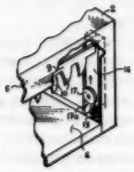
Simon Benmussa, 94 Bd - Pape Jean XXIII, 06300 Nice, France

Filed Nov. 5, 1982, Ser. No. 439,409

Int. Cl.³ F24J *1/00*

U.S. Cl. 126—263 **3 Claims**





1. In a self heating receptacle of the type having a food vessel for foods and at least two chemicals disposed adjacent to said food vessel that can react exothermically, the improvement comprising:

a pouch containing one of said at least two chemicals;

a drawer containing said pouch, said food vessel including an opening therein for accepting said drawer;

a guiding ramp disposed on the side of said drawer;

cutting means disposed inside of said opening for opening said pouch to permit said two chemicals to produce an exothermic reaction; and

roller means operatively connected to said cutting means for engaging said guiding ramp whereby upon the engaging of the guiding ramp on said roller means said cutting means moves toward the pouch to open said pouch thereby setting off an exothermic reaction.

4,510,920

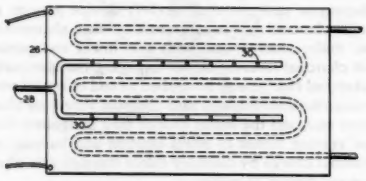
HEAT EXCHANGER MAT

Gunnar E. Walmet, Rexford, N.Y., assignor to New York State Energy Research and Development Authority, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,982

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—415 **16 Claims**



1. An improved heat exchanger mat for placement upon the bottom surface of a solar pond comprising:

a flexible membrane having

a first conduit for the reception, circulation and discharge of a heat exchanging fluid,

a second conduit for the reception and discharge of a dislodging medium, said conduit having a plurality of outlets opening on one side of the membrane; and

means for withdrawing the mat from the solar pond without disturbing the thermal gradient within the pond.

4,510,921

LATENT HEAT ACCUMULATING GREENHOUSE

Naomichi Yano; Isao Makido, and Hajime Ito, all of Osaka, Japan, assignors to Kubota Ltd., Osaka, Japan

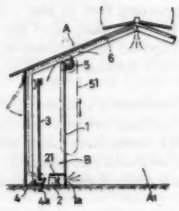
PCT No. PCT/JP82/00064, § 371 Date Sep. 10, 1982, § 102(e) Date Sep. 10, 1982

PCT Filed Mar. 8, 1982, Ser. No. 416,358

Claims priority, application Japan, Mar. 13, 1981, 56-37146

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—429 **1 Claim**



1. A latent heat accumulating greenhouse, wherein a heat accumulating chamber is created by a transparent sheet provided between a top and a floor surface on the north side in the

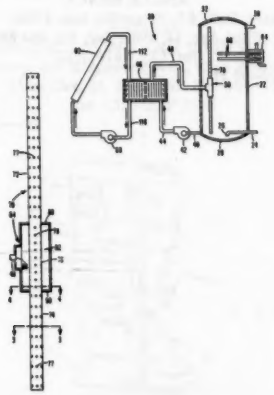
greenhouse, and a blower fan is disposed to confront an opening provided at the lower portion of said heat accumulating chamber, while, in the heat accumulating chamber, a heat accumulating unit in the form of a bag-like member is positioned, said heat accumulating unit having a large number of light transmitting windows and enclosing a phase transformation heat accumulating material therein, said heat accumulating unit is detachably suspended in a position close to the window panes at the north side of the greenhouse, the heat accumulating unit comprises a rectangular flat bag-like container of flexible material which is partitioned into a plurality of sections by checklike pattern heat seals, and a duct is provided in the greenhouse to lead the high temperature air at the upper part of the greenhouse into the heat accumulating chamber.

4,510,922

ENERGY STORAGE SYSTEM HAVING THERMALLY STRATIFIED LIQUID

Theodore Roussos, and Ravinder K. Sakhuja, both of Lexington, Mass., assignors to Thermo Electron Corporation, Waltham, Mass. and Thermo Electron Corporation, Waltham, Mass.

Filed Jan. 10, 1983, Ser. No. 456,936
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—435 **3 Claims**



1. Apparatus for achieving thermal stratification of potable water comprising:

a tank for storing water;

means for withdrawing water from said tank;

a solar heat exchange system for heating water withdrawn from said tank including a solar collector, heat exchange means for permitting heat transfer between a solar fluid and water circulated therethrough and for providing double-wall-separation between said solar fluid and said water during said heat transfer, means for circulating water withdrawn from said tank through said heat exchange means, and means for circulating a solar working fluid through said solar collector and thereafter through said heat exchange means; and

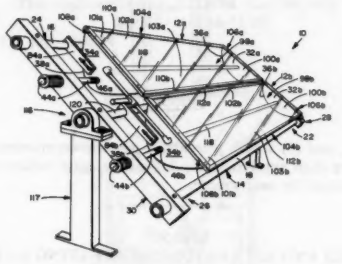
a header assembly for returning water from said heat exchange means to said tank at a level containing water whose temperature most nearly approximates the temperature of the returning water, said header assembly including an inlet extending through a wall of said tank, a vertical header pipe whose wall has a plurality of perforations distributed along its length and about its circumference, and wall means enclosing a portion of said header pipe intermediate between its upper and lower ends and forming a cavity for receiving returning water from said inlet.

4,510,923

SOLAR REFLECTOR

Allen I. Bronstein, 715 Florales, Palo Alto, Calif. 94306

Filed Aug. 26, 1983, Ser. No. 526,632
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—438 **17 Claims**



1. A solar reflector (**12***a*, **12***b*), comprising:

a longitudinally extending frame structure (**14**) having first (**20**, **22**) and second (**24**, **26**) ends and a second frame end closure (**30**);

a first form member (**32***a*, **32***b*) attached generally across said first end (**20**, **22**);

a second form member (**34***a*, **34***b*) parallel to said first form member (**32***a*, **32***b*) and in-board of said second end closure (**30**), said first (**32***a*, **32***b*) and second (**34***a*, **34***b*) form members (**32***a*, **32***b*, **34***a*, **34***b*) having peripheries (**36***a*, **36***b*, **38***a*, **38***b*) having identical form surfaces (**40***a*, **40***b*, **42***a*, **42***b*) along portions thereof;

a support member (**44***a*, **44***b*) attached to a respective one (**30** or **34***a*, **34***b*) of said second end closure (**30**) and said second form member (**34***a*, **34***b*) and extending toward a respective other (**34***a*, **34***b*, or **30**) thereof, said support member (**44***a*, **44***b*) being adapted for transferring the weight of said second form member (**34***a*, **34***b*) to said second end closure (**30**);

a flexible sheet (**60***a*, **60***b*) of a material having a reflective in-facing surface (**62**) having opposite edges (**64***a*, **64***b*, **66***a*, **66***b*) adapted for attachment to said identical form surfaces (**40***a*, **40***b*, **42***a*, **42***b*) and having lateral edges (**68***a*, **68***b*, **70***a*, **70***b*) generally perpendicular to said first and second form members (**32***a*, **32***b*, **34***a*, **34***b*);

securing means (**72***a*, **72***b*, **74***a*, **74***b*) for securing said opposite edges (**64***a*, **64***b*, **66***a*, **66***b*) to said identical form surfaces (**40***a*, **40***b*, **42***a*, **42***b*); and

stretching means (**55**) for stretching said flexible sheet (**60***a*, **60***b*) between said first (**32***a*, **32***b*) and second (**34***a*, **34***b*) form members (**32***a*, **32***b*, **34***a*, **34***b*).

4,510,924

BRACHYTHERAPY DEVICES AND METHODS EMPLOYING AMERICIUM-241

Laurence A. Gray, New Haven, Conn., assignor to Yale-New Haven Hospital, Inc., New Haven, Conn.

Continuation of Ser. No. 168,270, Jul. 10, 1980, abandoned, which is a continuation of Ser. No. 157,057, Jun. 6, 1980, abandoned. This application Jan. 13, 1983, Ser. No. 457,731
Int. Cl.³ A61N *5/00*
U.S. Cl. 128—1.2 **9 Claims**

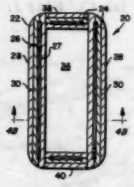
1. A radiation source for brachytherapy consisting essentially of:

a sealed capsule having a cavity therein; and

a brachytherapeutically effective quantity of americium-241 radioisotope disposed within said cavity,

wherein the walls of said capsule consist essentially of a material having a thickness which (1) will transmit brachytherapeutically effective dosages of gamma radiation generated by said quantity of americium-241 and, (2) will

contain the helium gas resulting from the decay of the alpha particles generated by said quantity of americium-241, and (3) which provides a neutron component of no more than approximately 1% of the total radiation dose provided by said source.



4,510,925

METHOD AND APPARATUS FOR TREATING A LIVING BODY

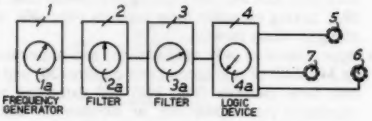
Dan Constantinescu, 60 rue des Mathurins, Paris, France (75008), assignor to Dan Constantinescu, Paris, France

Continuation of Ser. No. 300,690, Sep. 9, 1981, abandoned, which is a continuation of Ser. No. 038,943, May 14, 1979, abandoned. This application Apr. 1, 1983, Ser. No. 481,153

Claims priority, application France, May 17, 1978, 78 14615

Int. Cl.³ A61N *1/42*

U.S. Cl. 128—1.3 **10 Claims**



1. A method of treating living tissues by subjecting them to a magnetic field having a variable orientation produced by at least three electromagnetic means, the method comprising the steps of:

providing an electrical signal comprising a plurality of pulse trains occurring at a transmission frequency of between 1 and 600 trains per second, each said pulse train including a plurality of electrical pulses occurring at a signal frequency of between 40 KHz and 80 KHz and each said pulse train having a duration of between 100 and 200 microseconds;

selectively applying said pulses to said electromagnetic means to produce said magnetic field and change the orientation thereof with the occurrence of each said pulse; and

limiting the strength of said magnetic field to between 1 and 100 gauss, whereby the living tissue interprets said magnetic field as an internal informational signal for altering its behavior and the magnetic field causes substantially no direct physical action on the living tissue.

4,510,926

SUPPORT DEVICE FOR MEDICAL INSTRUMENTS

Yutaka Inaba, Tokyo, Japan, assignor to Tokyo Medical and Dental University, Tokyo, Japan

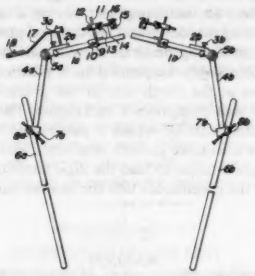
Continuation of Ser. No. 25,194, Mar. 29, 1979, abandoned. This application Aug. 8, 1983, Ser. No. 521,101

Claims priority, application Japan, Oct. 12, 1978, 53-125297

Int. Cl.³ A61B *17/02*

U.S. Cl. 128—20 **9 Claims**

9. A support device for medical instruments comprising a pair of semicircular track frames positionable to form a generally circular frame, and respective means for independently adjustably supporting said track frames for substantial universal orientation with respect to one another, each track frame having a trapezoidal cross-section, and each means for supporting including a holder having a dovetail groove in which the respective track frame is slidably fitted, and means for clamping the track frame to the holder with the aid of a gib.



4,510,927

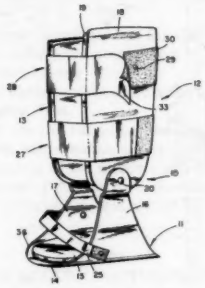
ANKLE BRACE

Rick E. Peters, R.R. #3, Batesville, Ind. 47006

Filed Apr. 14, 1983, Ser. No. 484,880

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—80 H **14 Claims**



1. An ankle brace apparatus for restricting inversion and eversion while permitting plantoflexion and dorsiflexion, said apparatus comprising:

a substantially rigid heel stirrup having a heel portion and a pair of upstanding inner and outer side portions, the heel portion and side portions being configured to be received about a person's foot with the side portions extending upwardly along opposite sides of the foot and overlying the ankle bones;

an inner padded member pivotally connected with the inner side portion of said heel stirrup and configured to be received adjacent the inside of the lower portion of the person's leg, said inner padded member including a substantially rigid support member and padding mounted to the support member and facing the person's leg;

an outer padded member pivotally connected with the outer side portion of said heel stirrup and configured to be received and adjacent the outside of the lower portion of the person's leg, said outer padded member including a substantially rigid support member and padding mounted to the support member and facing the person's leg;

first connection means for pivotally connecting the inner padded member with the inner side portion of said stirrup

with a first pivotal axis located adjacent and extending through the person's inner ankle bone;

second connection means for pivotally connecting the outer padded member with the outer side portion of said stirrup with a second pivotal axis located adjacent and extending through the person's outer ankle bone, the first pivotal axis being spaced closer than the second pivotal axis to the heel portion of said heel stirrup;

first attachment means for attaching said heel stirrup to the person's foot, said first attachment means including strap means for connection to each of the side portions and for being secured together overlying the front, upper surface of the person's foot; and

second attachment means for attaching said inner and outer padded members to the person's leg with the padding resting against the inner and outer portions, respectively, of the lower leg.

4,510,928

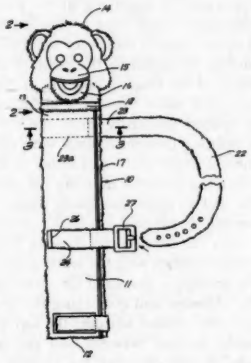
COMBINATION SLING AND THERAPY DEVICE

John B. Ackley, 430 Ridgewood Ave., Glen Ridge, N.J. 07028

Filed Oct. 24, 1983, Ser. No. 544,901

Int. Cl.³ A61F *5/40*

U.S. Cl. 128—94 **15 Claims**



1. A combination sling and therapy device comprising an elongated tubular member of pliable material, open at one end and closed at the other end, and having a slit portion extending throughout the major portion of its length incorporating adjustable fastener means whereby the tubular member can closely envelop an arm and cast assemblage from a point adjacent the fingers to at least the elbow of the user, an elongated band member having opposed ends engaging spaced portions of the tubular member, said band member being of a length to extend over the shoulder of a user and having adjustable means for providing the desired angular support for the forearm and cast, the closed end of said tubular member having a puppet-like characterization in which protruding movable lip portions are positioned to receive the thumb and fingers of the user, and at least one of said lip portions having a pressure actuated sound device for encouraging periodic manipulation of the thumb and fingers.

4,510,929

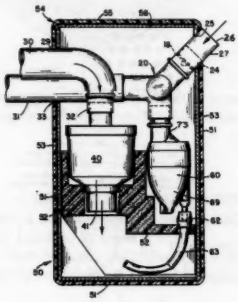
DISPOSABLE RADIOACTIVE AEROSOL INHALATION APPARATUS

Maurice E. Bordoni, R.D. #1 (Horton Rd.), Westtown, N.Y. 10998, and Ephraim Lieberman, 1 Victory Rd., Suffern, N.Y. 10901

Continuation of Ser. No. 360,370, Apr. 30, 1982, abandoned. This application Aug. 22, 1984, Ser. No. 642,718

Int. Cl.³ A61M *11/00*

U.S. Cl. 128—200.14 **8 Claims**



1. An aerosol inhalation apparatus for supplying an aerosol mist containing radioactive tagged particles and air to a subject, comprising a reusable lead-shielded container having lid means, whereby the contents of the container are readily accessible, and a disposable radioactive aerosol inhalation device, the device including first and second conduit means in said container and passing therethrough, mouthpiece means connected to the first and second conduit means externally of said container, valve means for controlling inhalation from said first conduit means and exhalation to said second conduit means, respectively, a nebulizer within said container and connected to said first conduit means, means positioned at least in part within the container and in fluid communication with said nebulizer for allowing introduction of radioactive solution from outside said container into said nebulizer, means associated with said nebulizer for generating an aerosolized mist carrying airborne radioactive tagged particles, means in fluid communication with a source of air and with said nebulizer for introducing a mixture of air and the mist into said first conduit means, and entrapping filter means in said container and connected to said second conduit means for removing the aerosol exhaled whereby the container may be reused and the device may be discarded after each use.

4,510,930

BREATHABLE GAS DISTRIBUTION APPARATUS

Elmer D. Garcia, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 8, 1983, Ser. No. 473,390

Int. Cl.³ A62B *7/02*

U.S. Cl. 128—202.22 **9 Claims**

1. An apparatus for safely supplying breathable gas to personnel at a controlled pressure and flow rate from a source of very high pressure, said apparatus comprising:

first pressure regulator means operably connected to said gas source for reducing pressure from said high pressure source to a greatly reduced pressure, well above atmospheric pressure;

second pressure regulator means operably connected to said first pressure regulator means for reducing gas pressure further;

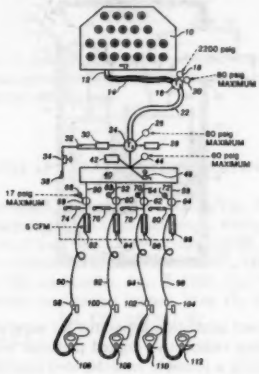
first overpressure relief means operably connected to said second pressure regulator means;

low pressure audible alarm means operably connected to said second pressure regulator means;

manifold means operably connected to said second pressure regulator means for receiving said breathable gas;

a plurality of conduits operably connected to said manifold means, each conduit in said plurality thereof for conducting said breathable gas;

second overpressure relief valve means and overpressure valve audible alarm means operably connected to each of said plurality of conduits;



flow meter means connected to each of said conduits for controlling the flow of breathable gas through each of said conduits at a desired flow rate and pressure; and

a plurality of individual breathing apparatuses, each individual breathing apparatus therein being singularly connected to one conduit in said plurality thereof for receiving said breathable gas conducted from said manifold means.

4,510,931

BARRIER FOR USE DURING CARDIOPULMONARY RESUSCITATION

Deborah Henderson, Elkton, Md., and Norman Street, Wilmington, Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Oct. 26, 1983, Ser. No. 545,659
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—202.28 **4 Claims**

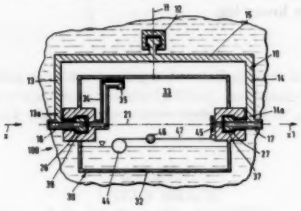
1. During cardiopulmonary mouth to mouth resuscitation, using by placing a laminate of expanded, porous polytetrafluoroethylene bonded to a porous fabric substrate, the laminate acting as a sanitary barrier between the mouth of the victim and the mouth of the CPR practitioner.

4,510,932

APPARATUS FOR SUPPLYING DIVERS WITH ARTIFICIAL RESPIRATORY GAS MIXTURES

Günter Luther, Wangelau; Peter Loebel, Toppenstedt; Gerhard Risse, Lübeck, and Volker Leiser, Cuxhaven, all of Fed. Rep. of Germany, assignors to GKSS-Forschungszentrum-Geesthacht GmbH, Geesthacht, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 422,691
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1981, 3139039
Int. Cl.³ A62B *7/00*
U.S. Cl. 128—204.29 **1 Claim**

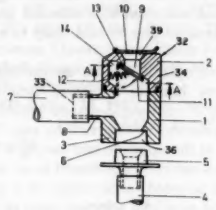


1. An apparatus for supplying divers with artificial respiratory gas mixtures, comprising a counterlung arranged to be worn by a diver, support means for said counterlung including swivel bearings for adjusting the position of said counterlung independently of the floating position of the diver, said counterlung comprises walls forming a chamber having a bottom and a top spaced upwardly from the bottom, said bottom having an opening communicating with the chamber for admitting ambient water into the chamber so that a water level is formed within the chamber dividing the chamber into a lower water space and an upper gas space, means within said chamber for forming an exhaled gas inlet communicating with the gas space with the exhaled gas flowing from the exhaled gas inlet into direct contact with the water level, means within said chamber for forming a gas outlet for removing gas from the gas space in the chamber and conveying the gas out of the chamber, said gas inlet located adjacent the top of said chamber and said gas outlet located between said gas inlet and the water level, means in said chamber for closing said gas outlet in response to the water level within said chamber, said means for closing said gas outlet comprises a valve positioned within said chamber and arranged to close said gas outlet, a control rod having opposite ends and pivotally mounted in said chamber at a point intermediate said opposite ends, said pivot dividing said control rod into first and second leg portions each terminating in said opposite ends, said valve being attached to said end of said first leg portion, a float attached to said end of said second leg portion, a weight attached to said second leg portion intermediate said pivot and float, said control rod being oriented within said chamber such that said second leg portion moves toward and away from said opening whereby said float follows the movement of the water level within said chamber, said means for forming the exhaled gas inlet includes a tube forming said exhaled gas inlet within said chamber and extending upwardly from the gas inlet and then downwardly toward and spaced from the water level where said tube extends outwardly from said chamber in axial alignment within said gas outlet.

4,510,933
SUCTION ADAPTER AND MEDICAL DRAINING SET AND METHOD OF USING A TRACHEAL DRAINING DEVICE

Michael Wendt, Münster-Nienberge, and Erik Schwanbom, Lübeck, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed May 13, 1983, Ser. No. 494,526
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222539
Int. Cl.³ A61M 16/00
U.S. Cl. 128—207.14 15 Claims



1. A suction adapter for connecting a suction catheter to a tracheal tube and which is also adapted to be connected to a respirator, comprising a hollow body having a first opening with a tracheal tube receiving fitting, a second opening having a respiratory line connection, and a third opening defining a drainage catheter introductory passage, the interior of said body defining a flow passage having a larger cross-section than said introductory passage and fluidically connecting said first opening and said third opening and fluidically connected to said second opening, the interior of said body defining a valve seat between the introductory passage and said flow passage, a valve member pivotally mounted in said body and engageable with said valve seat to close said introductory passage, spring means urging said valve member into engagement with said seat, a catheter assembly including a suction catheter having first and second end portions and a stop sleeve and means for slidably mounting said stop sleeve over said first end portion of said suction catheter, said stop sleeve having first and second ends and an exterior cross-section substantially the same as the cross-section of said introductory passage whereby said stop sleeve is slidably mounted therein with said first and extending into said flow passage, said stop sleeve also being provided with an exterior radially outwardly extending knurling at a spaced location from said first end thereof wider than said introductory passage such that when said stop sleeve is inserted into the said introductory passage up to said knurling, said first thereof forces said valve member back away from said seat.

4,510,934
SUTURE

Subhash K. Batra, 3465 Leonard St., Raleigh, N.C. 27607

Filed May 13, 1983, Ser. No. 494,243
Int. Cl.³ A61L 17/00
U.S. Cl. 128—335.5 8 Claims

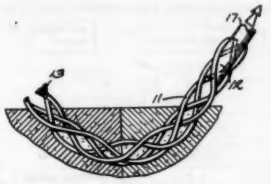
1. A surgical suture having

a removable monofilament core extending the entire length of the suture, and

a braided flexible sheath surrounding said core,

said core and said sheath being separably fastened together at one end,

said combination of core and sheath having sufficient stiffness to permit penetration of flesh,

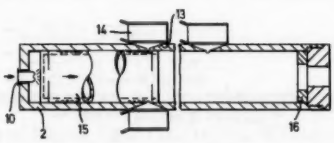


whereby said core is removed after penetration of flesh permitting tying of said sheath into a secure knot.

4,510,935
CARDIAC DEFIBRILLATOR

Joseph Spencer, London, England, assignor to Cardiac Recorders Limited, London, England

Filed Sep. 30, 1982, Ser. No. 430,251
Claims priority, application United Kingdom, Oct. 28, 1981, 8132459
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 D 16 Claims



1. An electrical energy source comprising:

(a) a chamber with which at least one piezoelectric transducer is operatively associated;

(b) an explosive cartridge associated with said chamber for generating gases therein in response to actuation of said cartridge;

(c) a member movably mounted in said chamber for displacement relative to the transducer in response to said gases; and

(d) means on said member for repeatedly striking said transducer when said member is displaced in the chamber by said gases thereby causing the transducer to produce a train output pulses.

4,510,936
APPARATUS FOR THE ELECTRICAL STIMULATION OF NERVES

Adrian J. Fourcin; David M. Howard, both of London, and John R. Walliker, Epsom, all of England, assignors to National Research Development Corporation, London, England

Filed Jan. 20, 1984, Ser. No. 572,402
Claims priority, application United Kingdom, Jan. 20, 1983, 8301526
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 R 17 Claims

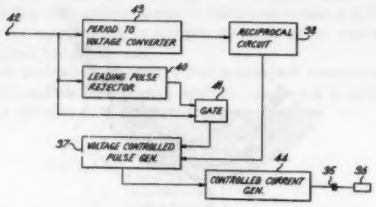
1. Apparatus for the electrical stimulation of nerves comprising

stimulus means for generating an electrical stimulus of alternating polarity and varying periods, which is non-zero for most of the duration of most of the said periods,

an electrode for location in a position where a nerve can be stimulated, and

charge control means for ensuring that the net charge ap-

plied to the electrode is zero in each of successive intervals substantially throughout stimulation, each interval



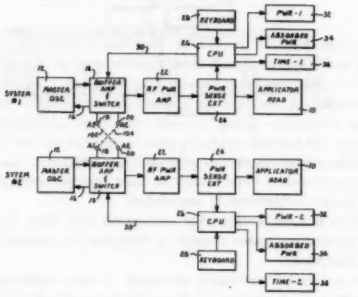
having a duration equal to an integral number of said periods not greater than three.

4,510,937

METHOD AND APPARATUS FOR OPERATING DUAL DIATHERMY APPLICATOR HEADS IN CLOSE PROXIMITY TO ONE ANOTHER

Noel A. Rogers, Shawnee Mission, Kans., assignor to International Medical Electronics, Ltd., Kansas City, Mo.

Filed Oct. 28, 1983, Ser. No. 546,559
Int. Cl.³ A61N 1/40
U.S. Cl. 128—422 **9 Claims**



1. A method of using a pair of diathermy applicator heads each driven by an oscillator and a drive circuit coupling the oscillator to the corresponding applicator head to apply RF energy thereto, said method comprising the steps of:

disabling one oscillator while enabling the other oscillator; and

electrically coupling the drive circuits together to effect application of RF energy from said other oscillator to both drive circuits to drive each applicator head with RF energy which is coherent in phase and frequency, thereby permitting the applicator heads to be used simultaneously in close proximity to one another without substantial interaction caused by phase or frequency differences.

4,510,938

BODY-MOUNTED LIGHT SOURCE-DETECTOR APPARATUS

Frans F. Jöbsis; Hans H. Keizer, and Ronald F. Overaker, all of Durham, N.C., assignors to Duke University, Inc., Durham, N.C.

Continuation-in-part of Ser. No. 289,413, Aug. 3, 1981, Pat. No. 4,380,240. This application Jan. 24, 1983, Ser. No. 460,578
Int. Cl.³ A61B 5/00
U.S. Cl. 128—633 **2 Claims**

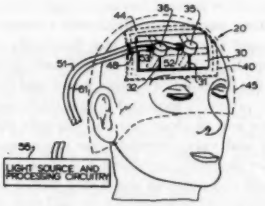
1. Spectrophotometric measuring apparatus for measuring a selected activity of a selected portion of a human body where such activity bears a measurable relation to an absorption characteristic of the selected portion for a particular wavelength of light, including in combination:

(a) first optical cable means providing a bundle of optical fibers with selected fibers connected for receiving and transmitting the output light emissions of light sources at measuring and reference wavelengths to a selected point of light entry on said selected portion of said body and other selected fibers connected for receiving and transmitting light emissions reflected directly back from said selected point of light entry to a processing means;

(b) second optical cable means providing a bundle of optical fibers connected for receiving and transmitting light emissions reflected and scattered to a selected point of light exit on said selected portion of said body to a processing means;

(c) a first preformed optical module comprising a molded cylindrical hollow housing enclosing first light guide means formed by a right-angle-shaped bundle of optical fibers optically coupled at one end to said first optical cable means and at the opposite end having a first optical light emitting face centrally positioned in an outer face of said housing and adapted to be mated in a substantially pressed fit relation with said selected point of light entry;

(d) a second preformed optical module comprising a second molded cylindrical hollow housing of the same size as said first housing and enclosing second light guide means formed by a right-angle-shaped bundle of optical fibers optically coupled at one end to said second optical cable means and at the opposite end having a second optical



light receiving face centrally positioned in an outer face of said second module housing and adapted to be mated in a substantially pressed-fit relation with said selected point of light exit;

(e) first and second socket structures of similar size, each being molded as an integral internally-hollow structure having a cylindrical side wall with an open base end and an opposite closed end, a slot in the wall structure for passing therethrough a respective optical fiber bundle leading from a respective said module, and a plurality of thin flexible tab members of uniform size and length extending radially outward from and circumferentially spaced on said base end, said first socket structure being adapted to receive in snug-fit relation said first optical module housing with the optical cable connected end portion of the fiber bundle associated with said first optical module passing through the slot of said first socket side wall and the said second socket structure being adapted to receive in snug-fit relation said second optical module with the optical cable connected portion of the fiber bundle associated with said second optical module passing through the slot of the said second socket side wall, and including adhesive means on the bottom surfaces of said tab members enabling the tab members of said first socket structure to be secured to the body in laterally spaced relation with respect to the tab members of the second socket structure whereby to secure said optical modules in correspondingly-spaced relation; and

(f) a flexible light-shielding pad having one adhesive sur-

faced side, having a pair of apertures formed to receive said socket structures in a predetermined spaced relation, having slit portions of said pad connecting said apertures to an outer edge thereof thereby enabling said shielding pad to be fitted over said tab members while allowing the optical cables associated with said modules to lead away from said shielding pad over and above the outer surface thereof and in a manner enabling said adhesive surfaced side to be adhesively secured to the body and the respective optical faces of said modules to be light shielded by said adhesively faced side of said panel.

4,510,939

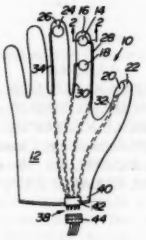
MEANS FOR TRANSFERRING ELECTRICAL ENERGY TO AND FROM LIVING TISSUE

Henry S. Brenman, Cinnaminson; Philip Katz, Princeton Junction, and Mark Singer, Moorestown, all of N.J., assignors to Biosonics, Inc., Philadelphia, Pa.

Filed Dec. 22, 1982, Ser. No. 452,319

Int. Cl.³ A61H *39/00*

U.S. Cl. 128—639 **12 Claims**



1. Apparatus for selectively transferring electrical energy to and from critical localities in living tissue for diagnostic purposes, comprising a glove of flexible fluid impervious elastomeric material, said material being sufficiently thin and flexible to afford to the wearer substantially unimpeded feel and manual dexterity so as to enable use of said glove for digital palpation while transferring energy to and from tissue, an electrode affixed to the index finger of said glove and covering the area of the glove beneath the tip of the distal phalange of the index finger of a wearer of said glove, thereby to facilitate application of said electrode directly to a palpated locality of tissue, a second electrode disposed adjacent to the tip of the thumb of said glove, an electrical connector coupled to said glove and adapted to be electrically connected to electrical circuitry external to said glove, and a plurality of flexible electrical conductors adhesively coupled to said glove and electrically connecting said electrodes and said connector.

4,510,940

PLETHYSMOGRAPH PRESSURE CORRECTING ARRANGEMENT

Karel H. Wesseling, Bunnik, Netherlands, assignor to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

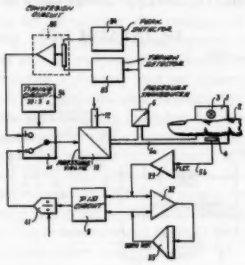
Filed Nov. 26, 1982, Ser. No. 444,363

Claims priority, application Netherlands, Nov. 27, 1981, 8105381

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—667 **33 Claims**

1. A method for correcting the cuff pressure in a plethysmographic arrangement for the indirect, non-invasive and continuous measurement of blood pressure in a body extremity by using a plethysmograph in a fluid-filled pressure cuff to be wrapped about said extremity, an electronic control circuit connected to the plethysmograph, and an electric pressure valve and a pressure transducer connected to said cuff, the cuff pressure being controlled by a plethysmographic signal from said plethysmograph in closed-loop operation with the aid of a servo-reference level obtained via a memory circuit in the control circuit, which servo-reference level is initially adjusted such that the cuff pressure corresponds substantially with the momentary arterial pressure, said method comprising the steps of:



opening the closed loop of the control circuit for a short interval,

in open-loop operation, adjusting the cuff pressure with the pressure valve at an intermediate pressure derived from the pressure last measured at the pressure transducer, and

adjusting the servo-reference level via the memory circuit.

4,510,941

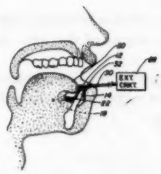
TEMPERATURE, PULSE AND RESPIRATION MOUTHPIECE PROBE

Carolyn M. Semrow, Island Lake; Mark W. Kolstedt, Cary, and William J. Dunn, Libertyville, all of Ill., assignors to The Kendall Company, Walpole, Mass.

Filed Aug. 30, 1982, Ser. No. 412,535

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—671 **48 Claims**



1. A probe, comprising:

a mouthpiece having a portion contoured to fit over a substantial portion of at least some of a patient's teeth; and

means for electronically sensing the temperature of the patient's gum within the patient's mouth,

said temperature sensing means being mounted to said mouthpiece in sensing relationship with the interior of the patient's mouth,

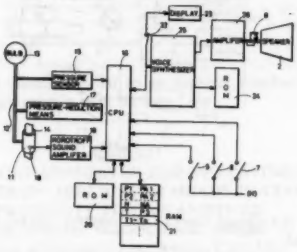
said contoured portion, when fitted over the patient's teeth, holding the mouthpiece and thus the sensing means against any substantial movement relative to said teeth, and

said contoured portion also being fitted over the patient's gum and said temperature sensing means being held against the patient's gum by said contoured portion to sense the temperature of the patient's gum.

4,510,942
ELECTRONIC SPHYGMOMANOMETER

Ryuichi Miyamae, Osaka, and Haruo Yasuda, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 14, 1983, Ser. No. 466,136
Claims priority, application Japan, Feb. 15, 1982, 57-20297[U]; Feb. 16, 1982, 57-20861[U]; Feb. 17, 1982, 57-21913[U]
Int. Cl.³ A61B 5/02
U.S. Cl. 128—680 4 Claims



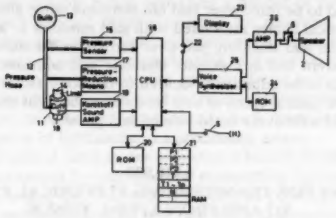
1. A sphygmomanometer comprising:
a pressure cuff;
pressure detection means for detecting the pressure in said cuff;
means associated with said cuff for detecting Korotkoff sounds;
means for determining systolic and diastolic pressure values in accordance with outputs from the pressure detection means and Korotkoff sound detection means;
memory means for storing data representing the systolic and diastolic pressure values determined by said determining means;
end detection means for detecting the end of a measuring operation;
output means for audibly outputting the data stored in said memory means representing said pressure values in response to output from the measuring operation end detection means; and
repeat signal input means for actuating said output means to audibly repeat output of the data stored in said memory means;
wherein said output means is responsive to said repeat signal input means for audibly repeating the data stored in said memory means.

4,510,943
DISPLAY INHIBITION IN AN ELECTRONIC SPHYGMOMANOMETER

Ryuichi Miyamae, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 23, 1983, Ser. No. 468,882
Claims priority, application Japan, Feb. 24, 1982, 57-26430[U]
Int. Cl.³ A61B 5/02
U.S. Cl. 128—680 8 Claims

1. An electronic sphygmomanometer comprising:
pressure detection means;
determination means operatively connected to said pressure detection means for determining a person's systolic pressure and diastolic pressure;
digital display means for visually displaying said systolic pressure and said diastolic pressure; and
inhibition means for selectively preventing said person from receiving an indication of said systolic pressure and said

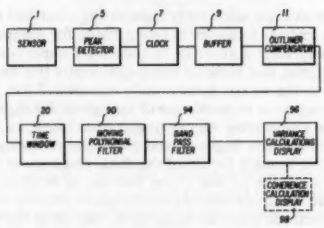


diastolic pressure during detection thereof by inhibiting the operation of said digital display means.

4,510,944
METHOD AND APPARATUS FOR EVALUATING RHYTHMIC OSCILLATIONS IN APERIODIC PHYSIOLOGICAL RESPONSE SYSTEMS

Stephen W. Porges, 1407 Grandview, Champaign, Ill. 61820

Filed Dec. 30, 1982, Ser. No. 454,536
Int. Cl.³ A61B 5/02
U.S. Cl. 128—687 35 Claims

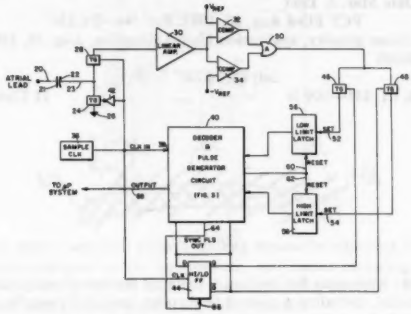


1. A system for detecting amplitude variations in the rhythmic oscillations of heart period in a predetermined frequency band of interest, comprising:
sensor means for detecting an occurrence of an event in the cycle of a heartbeat;
timing means for determining time intervals between the occurrence of said event in successive heartbeats;
buffer means for storing said time intervals between the occurrence of said event in successive heartbeats;
means for reading out said intervals stored in said buffer means at predetermined time intervals;
first filter means responsive to the intervals read out from said buffer means, including a means for determining an aperiodic portion of said intervals read out from said buffer means and a subtraction means for subtracting said aperiodic portion from said intervals read out from said buffer means and for producing a corresponding output;
second filter means for receiving and filtering the output of said first filter means and for outputting a signal in a band-pass region determined by said predetermined frequency band of interest; and
output means for calculating the variance of rhythmic oscillations in the signal outputted by said second filter means.

4,510,945
P WAVE DETECTION SYSTEM

Francisco J. Barreras, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Jul. 12, 1982, Ser. No. 397,026
Int. Cl.[3] A61B 5/04
U.S. Cl. 128—696 3 Claims



1. A system for detecting the P wave on an intracardiac lead, comprising

means for synchronously generating a test signal proportional to the signal on the cardiac lead, thus having approximately the same slew rate as the intracardiac signal,

sample timing means for establishing alternately long and short relative sample time windows,

means for resetting said test signal to a known level at the beginning of each of said sample windows,

means for registering whether the test signal exceeded a predetermined threshold during said sample windows, respectively, and

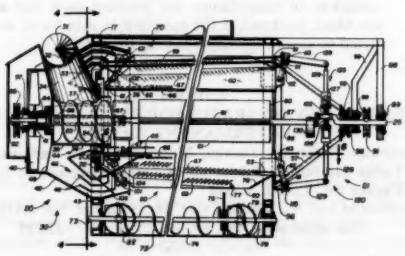
means responsive to said registering means for producing a good sample signal when said test signal exceeded the threshold during the long sample window but did not exceed the threshold during the short sample window,

whereby the good sample signal indicates that the corresponding intracardiac signal waveform was within a predetermined range of slew rates characteristic of the patient's P wave.

4,510,946
INFEED MECHANISM FOR ROTARY CLEANING DEVICE IN COMBINES

Frans J. G. C. Decoene; Gilbert J. I. Strubbe, both of Zedelgem, Belgium, and Robert R. Todd, Leola, Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Aug. 17, 1982, Ser. No. 408,997
Int. Cl.[3] A01F 12/44
U.S. Cl. 130—27 T 30 Claims



1. In a combine having a frame; a threshing and separating means mounted on said frame for separating threshed grain from unthreshed crop material; a crop gathering means mounted on said frame adjacent said threshing and separating means for collecting unthreshed crop material and conveying said crop material to said threshing and separating means; a rotary cleaning means for cleaning unwanted residue from said threshed grain, said rotary cleaning means including a cleaning cylinder rotatably mounted on said frame about an axis of rotation, said cleaning cylinder having sieve means rotatable about said axis of rotation for separating clean grain from unwanted residue by permitting the passage of clean grain therethrough, said sieve means being spaced radially outwardly from said axis of rotation to define an axial opening through said cleaning cylinder, and an infeed mechanism mounted forwardly of said cleaning cylinder for feeding said threshed grain into said cleaning cylinder; fan means mounted on said frame proximate to said cleaning cylinder to create a flow of air through said sieve means to assist in cleaning said unwanted residue from said threshed grain by urging said residue into an airborne state; and drive means for operatively powering said crop gathering means, said threshing and separating means, said fan means and said rotary cleaning means, an improved infeed mechanism comprising:

an infeed auger mounted for rotation, said auger having at least one flight terminating in an outwardly extending distributing paddle, said paddle being disposed within the axial opening of said cleaning cylinder and operable to distribute said threshed grain outwardly onto said cleaning cylinder, said paddle being spaced inwardly of said cleaning cylinder to permit the flow of air from said fan means through said threshed grain before being received on said cleaning cylinder, said cleaning cylinder including a grain pan positioned radially outwardly from said paddle to receive threshed grain thrown outwardly therefrom;

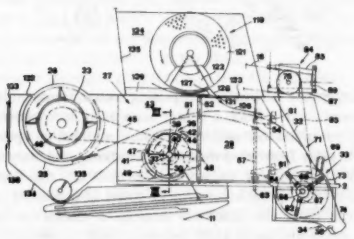
an infeed housing concentric with said infeed auger and cooperable therewith to convey threshed grain onto said at least one distributing paddle; and

grain delivery means for feeding threshed grain to said infeed auger.

4,510,947
COMBINE HARVESTER STRAW HOOD

Thierry E. G. Devriese, Brugge, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Feb. 22, 1984, Ser. No. 582,247
Claims priority, application United Kingdom, Feb. 25, 1983, 8305218
Int. Cl.[3] A01F 12/00
U.S. Cl. 130—27 B 3 Claims



1. In a combine harvester having a mobile frame; threshing and separating means supported on said frame to harvest crop material fed thereto, said threshing and separating means including rotary means for propelling crop material discharged from said threshing and separating means; a straw hood mounted on said frame rearwardly of said rotary means to guide the propelled crop material for discharge from the combine harvester, said straw hood having an upper generally horizontal surface under which the crop material is propelled by said rotary means; a rotary air screen supported by said

frame adjacent and above said generally horizontal surface, said rotary air screen having a perforated surface and a stationary impervious member mounted adjacent said perforated surface; means to draw air inwardly through said perforated surface, said stationary member serving to block the flow of air through the perforated surface and permit foreign matter collected thereon to fall from the air screen, the improvement comprising:

an aperture formed in the horizontal surface of said straw hood proximate to the rearward edge of said stationary member so that the movement of air induced by the operation of the rotary air screen and the flow of propelled crop material beneath the straw hood will effect a discharge of said foreign matter through said aperture into the flow of propelled crop material; and

a deflector mounted on said straw hood along the rearward edge of said aperture to deflect said foreign matter into said aperture.

4,510,948

DISCHARGE ASSIST MEANS FOR COMBINE HARVESTERS

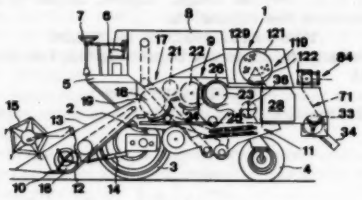
Marcel A. Dekeyzer, Brugge, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Feb. 22, 1984, Ser. No. 582,498

Claims priority, application United Kingdom, Feb. 25, 1983, 8305258

Int. Cl.³ A01F *12/00*

U.S. Cl. 130—27 R **9 Claims**



1. A combine harvester comprising a main frame adapted for movement over a field; a rotary separating mechanism transversely mounted on said main frame and being operable to separate grain from crop material by moving said crop material spirally therearound to respective ends of the separating means; means operable to project straw in a desired path for discharge from the machine through a discharge opening; rotary straw discharge assist means located below said desired path and between the separating mechanism and the discharge opening; chopping means associated with the respective ends of said separating means, but spaced therefrom, so as to be capable of receiving crop material from the separating means; and deflector means pivotable about generally vertical axes and disposed between each respective end of the separating means and the associated chopping means, said deflector means being selectively positionable to direct the flow of crop material to the chopping means from the separating means and to deflect crop material inwardly of the machine for discharge from the latter in a central windrow.

4,510,949

FEEDING PARTICULATE MATERIAL, ESPECIALLY TOBACCO

Edward G. Preston, Orpington, England, and David B. Stewart, Dundee, Scotland, assignors to Molins, PLC, London, England

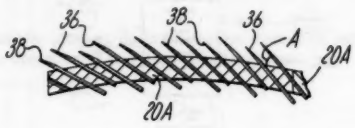
PCT No. PCT/GB82/00258, § 371 Date Apr. 25, 1983, § 102(e) Date Apr. 25, 1983, PCT Pub. No. WO83/00604, PCT Pub. Date Mar. 3, 1983

PCT Filed Aug. 26, 1982, Ser. No. 491,334

Claims priority, application United Kingdom, Aug. 26, 1981, 8126005

Int. Cl.³ A24C *5/39*

U.S. Cl. 131—109 R **11 Claims**



11. Apparatus for feeding a metered stream of particulate material, including a pinned feed roller having forwardly inclined pins and arranged to feed material from a supply and past a pinned refuser roller whereby the feed roller will convey a metered stream of the material, the pins of the feed roller comprising relatively high pins which lie in obliquely extending rows between rows of relatively low pins.

4,510,950

FOAMED, EXTRUDED, TOBACCO-CONTAINING SMOKING ARTICLE AND METHOD OF MAKING SAME

Gus D. Keritsis, and Walter A. Nichols, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 30, 1982, Ser. No. 457,505

Int. Cl.³ A24B *3/14*

U.S. Cl. 131—353 **17 Claims**

1. A method of making a foamed, extruded, tobacco-containing smoking article, comprising the steps of:

(a) dry blending from about 5 to about 98 wt. % of tobacco particles having a particle size of up to about 5 mesh and an OV value of from about 3 to about 20%, with from 0 to about 60 wt. % of a filler having a particle size of up to about 350 μm, and from about 2 to about 40 wt. % of a cellulosic binder selected from the group consisting of hydroxypropyl cellulose, carboxymethyl cellulose, and its sodium, potassium and ammonium salts, cross-linked carboxymethyl cellulose, and its sodium, potassium and ammonium salts, hydroxyethyl cellulose, ethyl hydroxyethyl cellulose, hydroxypropyl methyl cellulose, methyl cellulose, ethyl cellulose, and mixtures thereof;

(b) admixing the dry blend with water to form a wet blend containing from about 15 to about 50 wt. % of water; then

(c) extruding the wet blend from step (b) under extrusion conditions of temperature and pressure such that as the wet blend is extruded the moisture in said blend is converted to steam, thereby foaming the article.

4,510,951

METHOD AND APPARATUS FOR DIAGNOSIS OF HAIR FOR PERMANENT WAVING

Katsuhiro Watanabe, Tochigi; Masayuki Minei, Saitama, and Toshio Horikoshi, Tokyo, all of Japan, assignors to San-Ei Kagaku Co., L.T.D., Japan

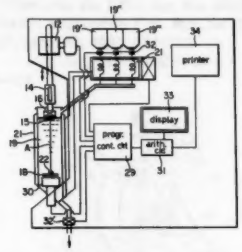
Division of Ser. No. 434,861, Oct. 18, 1982, Pat. No. 4,474,193. This application Sep. 19, 1983, Ser. No. 533,235

Int. Cl.³ A45D *7/00*

U.S. Cl. 132—7 **4 Claims**

1. An apparatus for diagnosis of hair for permanent waving comprising means capable of holding a swatch of hair in a liquid bath while fixing the hair swatch at its both ends, a

rotating member disposed on one side of said hair swatch holding means for imparting twists to the hair swatch, counter means arranged for making interlocking operation with said rotating member, tension adjusting means disposed on the



other side of said hair swatch holding means for adjusting the tension imparted to the hair swatch, and means including a movable arm to which said hair swatch holding means is connected through said tension adjusting means.

4,510,952

HAIR TREATING ARTICLE AND A METHOD OF ITS USE

Giorgos X. Gikas, Washington, D.C., assignor to The Gillette Company, Boston, Mass.

Filed May 20, 1982, Ser. No. 380,156
Int. Cl.³ A45D *2/24*
U.S. Cl. 132—37 R **7 Claims**

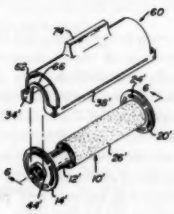
1. A flexible tubular sleeve for use in conjunction with a source of heat for the application of a treating composition to the hair, said sleeve comprising an inner layer of a liquid impermeable material and an outer reservoir layer, said reservoir layer being impregnated with a hair treating composition having a melting point of about 22°–100° C.

4,510,953

HAIR CURLER

Richard Caruso, 7801 Montgomery Ave., Elkins Park, Pa. 19117

Filed Sep. 23, 1983, Ser. No. 535,114
Int. Cl.³ A45D *2/00*
U.S. Cl. 132—40 **12 Claims**



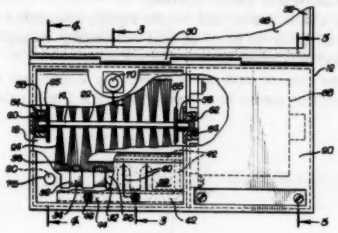
1. A hair curler for use with steam comprising a hollow perforated core, said core having an opening only at one end, a porous sleeve around said core, a rim at each end of the core, the diameter of the rim being greater than the diameter of the core, a shield which is generally semi-circular, said shield having end walls, said shield having a slot at each end, each slot receiving one of said rims so that the core is between said end walls.

4,510,954

APPARATUS AND METHOD FOR AUTOMATICALLY REMOVING FINGERNAIL POLISH

Richard J. Miller, 19009 Laurel Park Rd. #460, Dominguez Hills, Calif. 90220

Filed May 12, 1982, Ser. No. 377,381
Int. Cl.³ A45D *29/20*
U.S. Cl. 132—75 **6 Claims**



1. A device for removing fingernail polish simultaneously from a plurality of fingernails using fingernail polish removing fluid comprising:

a housing having a fluid compartment and a motor compartment, said fluid compartment receiving nail polish removing fluid;

a generally-cylindrical rotatable brush having a central core and a periphery, said brush being mounted with its axis disposed horizontally in the fluid compartment, said periphery being positionable in the polish removing fluid during rotation of the brush to wet said periphery with the fluid;

a motor mounted in the motor compartment and having a shaft connected to the central core of the brush so as to rotate the brush about its axis when the motor is energized;

means sealing the two compartments from one another so that polish removing fluid in the fluid compartment cannot leak into the motor compartment;

a top wall in part defining the fluid compartment and having an elongated opening therein parallel to the brush axis and aligned vertically with the periphery of the brush;

finger-positioning platforms extending downwardly from the top wall adjacent the side of the opening remote from the brush axis for positioning the fingernails of fingers inserted through the opening in a substantially vertical plane so that the wetted periphery of the brush brushes along the length of the fingernails and so that the inserted fingers are not immersed in the fluid;

said motor rotating in a direction so that the periphery of the brush moves generally downwardly with respect to the platforms; and

a finger-penetratable flexible member mounted on the top wall and covering the elongated opening for closing around the fingers when the fingers are inserted through the opening onto the platform and preventing polish removing fluid in the fluid compartment from splashing out of the fluid compartment through the opening.

4,510,955

FOLDABLE UMBRELLA

Terry Hermanson, New York, N.Y., assignor to Mr. Christmas Incorporated, New York, N.Y.

Filed Jun. 3, 1983, Ser. No. 500,692
Int. Cl.³ A45B *19/00*
U.S. Cl. 135—25 R **14 Claims**

1. An umbrella comprising

a canopy,

flexible canopy supporting booms attached to said canopy at

their ends and at spaced intervals along the upper surface of said booms with the umbrella in the open condition,

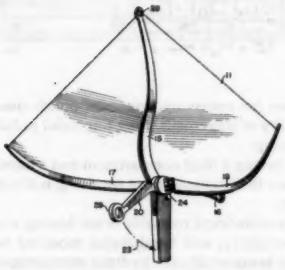
a handle portion,

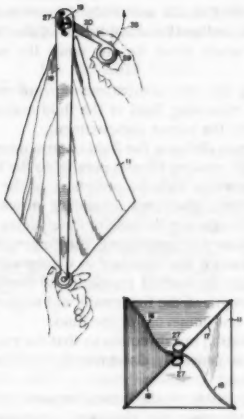
a connecting means at one end of said handle portion pivotally connecting said booms to said handle portion,

a control lever extending from and pivotally connected to said handle portion at said connecting means to pivot about an axis substantially perpendicular to the longitudinal axis of said handle portion,

at least a first one of said booms rigidly connected to said control lever to pivot at said connecting means with a pivotal movement of said control lever,

a second one of said booms pivotally connected to said connecting means in a manner to pivot freely relative to





said control lever about substantially the same perpendicular axis of rotation as said first one of said booms upon being pulled by said canopy which is pulled by rotation of said first one of said booms,

third and fourth ones of said booms hingedly connected respectively to said first and second ones of said booms and extending with the umbrella in the open condition with said first and second ones in a plane perpendicular to said third and fourth ones of said booms,

said booms and handle lying parallel to each other and extending in the same direction from said connecting means, and said control lever extending from said connecting means, when the umbrella is in the collapsed condition.

4,510,956

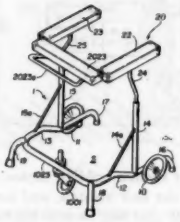
WALKING AID, PARTICULARLY FOR HANDICAPPED PERSONS

Lorraine King, 201 W. 89th St., New York, N.Y. 10024

Filed Aug. 15, 1983, Ser. No. 522,999

Int. Cl.[3] **A61H** *3/04*

U.S. Cl. 135—67 **19 Claims**



1. Walking aid for handicapped persons, having

a frame **(1)**;

wheel means **(10, 11, 1001)** on the frame for rolling movement thereof over a surface **(S)**;

and a support structure adapted for engagement by the upper extremities of the using person secured to the frame;

wherein, in accordance with the invention, the wheel means comprise

three wheels **(10, 11, 1001)**;

the frame comprises

a lower, generally U-shaped structure having a pair of parallel legs **(12, 13)** and a connecting frame element **(1023)**,

one each of the wheels **(10, 11)** being mounted laterally of the respective legs **(12, 13)** on the free end portions thereof for rotation in a plane essentially perpendicular to said surface, and about fixed axes of rotation, transverse to the U-shaped structure, the third wheel **(1001)** being a caster wheel means secured to the connecting element **(1023)** centrally thereof for rotation about an axis parallel to said surface and for swiveling about an axle which is freely movable about a vertical swivel axis,

and projecting spurs **(16–19)** extending downwardly and terminating short of contact with the surface **(S)** leaving a clearance,

two spurs **(16, 17)** each being positioned at one of the respective free end portions of the U-shaped structure and extending rearwardly and downwardly therefrom, and two spurs **(18, 19)** each being secured to one of the respective laterally spaced portions of the legs adjacent the connecting element **(1023)** and extending outwardly and downwardly therefrom, the lower end of each spur being positioned a slight distance above the surface to provide assurance against accidental tipping and provide braking on controlled tipping of the walking aid;

and wherein the support structure comprises

a pair of upright struts **(14, 15; 24, 25)** each extending upwardly from a location behind the center of a respective one of the parallel legs **(12, 13)** of the generally U-shaped structure,

and a support surface **(20)** of generally U-shaped planar outline, secured to the upright struts and positioned in approximate alignment with the U-shaped structure, and adapted for supporting and partly surrounding the person.

4,510,957

RESILIENT SUPPORT FOOT FOR WALKING AIDS, PARTICULARLY CRUTCHES

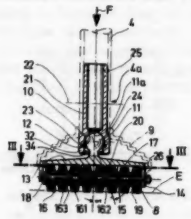
Xaver Frank, Lengenwang, Fed. Rep. of Germany, assignor to S & F Orthopädietechnik GmbH, Görisried, Fed. Rep. of Germany

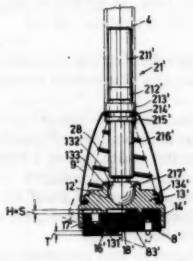
Filed Jul. 28, 1982, Ser. No. 402,594

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3131027; Mar. 30, 1982, 3211732

Int. Cl.³ A45B *9/04*

U.S. Cl. 135—84 **32 Claims**





1. A resilient support foot for a walking aid comprising:

a resilient sole body having a first surface for establishing contact with the ground;

a support plate having a bordering skirt and a support plate face, the sole body being loosely fitted within the skirt, the skirt providing lateral support for the sole body;

a second sole body surface remote from the first surface cooperating with the plate face to support the sole body;

universal joint means for linking the support plate to a support shaft of the walking aid; and

fastening means for releasably securing the sole body within the skirt, the fastening means penetrating through the skirt and through the sole body.

4,510,958

APPARATUS AND METHOD FOR TRANSFERRING A BINGHAM SOLID THROUGH A LONG CONDUIT

David L. Coursen, Mercersburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 375,543, May 6, 1982, Pat. No. 4,462,429. This application Apr. 16, 1984, Ser. No. 590,839

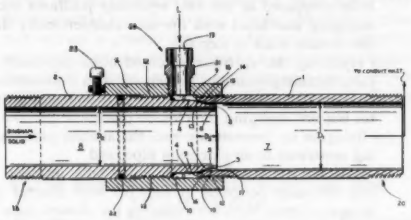
Int. Cl.³ F17D *1/16*

U.S. Cl. 137—13 **35 Claims**

1. A method of transferring a Bingham solid through a conduit comprising:

(a) exerting a pressure on the Bingham solid to force it axially through an upstream cylindrical chamber having a substantially uniform diameter, from which the Bingham solid moves axially into and through an adjoining downstream cylindrical chamber having a substantially uniform diameter larger than that of the upstream chamber, and from which it then moves into and through a conduit of substantially uniform diameter substantially equal to that of said downstream cylindrical chamber; and

(b) simultaneously injecting a lubricating fluid into an annular chamber coaxial with said upstream and downstream cylindrical chambers, said annular chamber being connected to said downstream chamber by an annular passageway coaxial with said cylindrical chambers, said annular passageway having a constricted annular throat portion of adjustable width and a wider annular exit portion that ends facing in the downstream direction in a plane that delimits said cylindrical chambers and is normal to their common axis, said annular exit portion having an



outside diameter substantially equal to the diameter of said downstream chamber and an inside diameter substantially greater than the diameter of said upstream chamber;

(1) the rate at which the Bingham solid is forced through said chambers and conduit, (2) the rate of injection of said lubricating fluid, and (3) the width of said constricted annular throat being selected to give a lubricating fluid flow rate which is no greater than about 5% of the Bingham solid flow rate, on a weight basis, and a drag force on the Bingham solid moving through a given section of said conduit which is no greater than the motive force of gravity on the Bingham solid when said given section of conduit is made vertical.

4,510,959

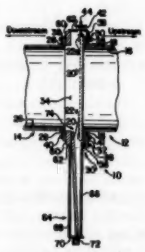
METHOD FOR INSTALLATION OF AN EXTENDED HEADER

Ward F. Gidick, West Newton, Pa., assignor to Rayn. nd Kaiser Engineers Inc., Oakland, Calif.

Division of Ser. No. 375,392, May 6, 1982,. This application Feb. 21, 1984, Ser. No. 582,098

Int. Cl.³ F16L *23/00*

U.S. Cl. 137—15 **9 Claims**



1. A method for extending in a downstream direction an existing fluid containing pipe having an annular flange on which a terminal closure plate is retained in juxtaposed relation by a plurality of peripherally arranged, downstream oriented bolts, each of which bolts passes through a pair of aligned longitudinal aperatures in the flange and closure plate to engage a retaining nut on its downstream end and wherein a portion of said pairs of aligned longitudinal aperatures are

designated as even retaining positions and the remainder of said pairs of aligned aperatures are designated as odd retaining positioning, said method comprising the steps of:

(a) replacing the downstream oriented bolts and nuts engaged therewith at the even retaining positions with upstream oriented bolts;

(b) independently fixing to the closure plate the nuts engaged with the downstream oriented bolts at the odd retaining positions and then removing said bolts from the odd retaining positions;

(c) fixing an annular pipe connecting apparatus at its upstream end to the annular flange of the existing pipe by first engaging said apparatus with downstream oriented bolts emplaced at the odd retaining positions and then engaging said bolts with the nuts independently fixed to the closure plate in step (b);

(d) replacing the upstream oriented bolts emplaced at the even retaining positions in step (a) with downstream oriented bolts engaging the annular pipe connecting apparatus but not engaging the closure plate;

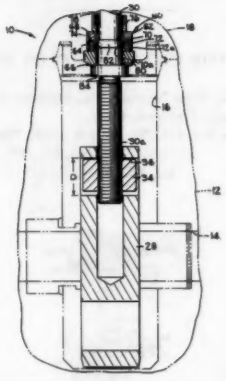
(e) fixing, at its downstream end, the annular pipe connecting apparatus to an extension pipe; and

(f) replacing the downstream oriented bolts installed at the odd retaining positions in step (c) with shorter downstream oriented bolts not engaging the closure plate or the nuts independently fixed thereto in step (c), such that the closure plate may be disengaged and displaced from the existing pipe.

4,510,960
VALVE STEM-TO-BONNET BACKSEAT

Charles E. Jennings; Claud C. Barrington, both of Houston; Lien-Yan Chen, Spring; Bob C. Hopkins, Houston; John N. McIntyre, Spring, and Alfred P. Regitz, Houston, all of Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Sep. 30, 1983, Ser. No. 538,002
Int. Cl.³ F16K *41/16, 17/38*
U.S. Cl. 137—75 **21 Claims**



1. A valve comprising a body with a flow passage extending therethrough and a chamber intersected by said flow passage;

a valve closure element positioned in said chamber to control flow through said flow passage;

a bonnet secured to said body and having a bore communicating with said chamber;

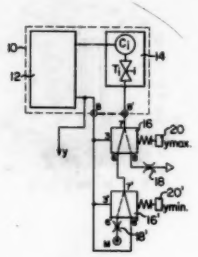
a valve stem extending through said bore and connected to said closure elements; and

means for backseating said stem on said bonnet in response to axial movement of said stem and respect to said bonnet, said backseating means comprising an annular metal seal element of generally U-shape in cross-section, said seal element including inner and outer annular sealing lips having a round sealing surface configuration, said inner and outer lips functioning to establish a metal-to-metal seal with said valve stem and said bonnet.

4,510,961
PNEUMATIC CONTROLLER

Vladimir Multrus, Limeshain, Fed. Rep. of Germany, assignor to Honeywell GmbH, Offenbach, Fed. Rep. of Germany

Filed May 4, 1983, Ser. No. 491,000
Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218230
Int. Cl.³ G05D *16/00*
U.S. Cl. 137—86 **8 Claims**



1. A pneumatic controller having automatic switching of its time behavior as a function of a control pressure, said controller comprising:

pneumatic controller means having an output for providing a control pressure in response to a controlled variable, said pneumatic controller means having a feedback input;

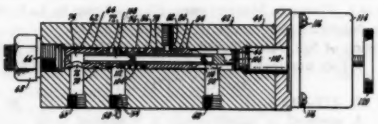
pneumatic integrator means connected to said feedback input and having an integrator input for establishing an integrating feedback path between said integrator input and said feedback input; and,

relay means connected to said pneumatic controller means output, to said integrator input and to atmosphere for normally connecting said integrator input to said pneumatic controller means output and for connecting said integrator input to atmosphere when said control pressure attains an upper limit.

4,510,962
PRECISE PRESSURE REGULATOR FOR A VARIABLE OUTPUT PUMP

Philip J. Mott, Des Plaines, and Kenneth R. Gallaher, Lake in the Hills, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 30, 1983, Ser. No. 509,553
Int. Cl.³ F04B *49/08*
U.S. Cl. 137—102 **17 Claims**



1. A precise pressure regulator suitable for use with a variable output pump, said precise pressure regulator comprising a housing defining a bore having pressure and relief zones, a

pressure port communicating with said pressure zone and adapted for communication with a pump pressure to be regulated, a relief port communicating with said relief zone and adapted for communication with a reservoir, a control port adapted for communication with a pump control pressure, follower and spool members movable in said bore, one of said members defining passage means including a first hole for communicating said pressure zone with said control port and a second hole for communicating said control port with said relief zone, and biasing means providing a force tending to move said follower member in a direction which blocks said first hole and unblocks said second hole, pressure in said pressure zone providing a force tending to move said follower member in a direction which unblocks said first hole and blocks said second hole, said members being constructed and arranged such that the position of said spool member in said bore determines the level at which pressure is regulated.

4,510,963

PROPORTIONAL-FLOW ELECTROHYDRAULIC CONTROL

Glen T. Presley, Angola, Ind., and Lloyd L. Lautzenhiser, Ridgecrest, Calif., assignors to Electro-Hydraulic Controls, Inc., Angola, Ind.

Division of Ser. No. 339,483, Jan. 15, 1982, Pat. No. 4,430,486. This application Nov. 21, 1983, Ser. No. 553,561

Int. Cl.³ G05D *11/12, 16/20*

U.S. Cl. 137—117 **31 Claims**

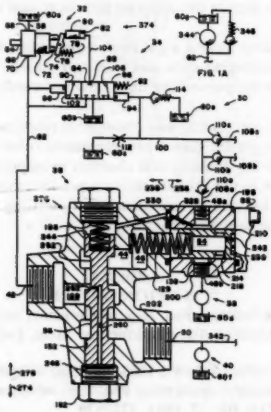


FIG. 1A

1. An electrohydraulic control which comprises a first port (**42** or **46**);

a second port (**50, 172** or **48***b*);

first valve section means (**122**); comprising a flow path (**240**), and comprising a first valving element (**54**) that is selectively positionable between minimum-conductance (FIG. **2**) and maximum-conductive (FIG. **6**) positions, for selectively controlling the conductance of said flow path and for developing a differential pressure through said flow path that is proportional both to a selected conductance and to the instantaneous rate of fluid flow through said flow path;

second valve section means (**126**), being operatively connected to said first and second ports, being operatively connected to said first valve section means, and comprising a second valving element (**56**), for selectively positioning said second valving element and for controlling fluid flow from said first port to said second port in response to said differential pressure;

means (**129**) for urging said first valving element to said minimum-conductance position with a first offset force;

electrical force-motor means (**52**), operatively engaging said first valving element, for receiving an effective driving voltage, for applying a second offset force to said first valving element that is equal in magnitude and opposite in direction to said first offset force in response to an effective null voltage applied to said force-motor means, and for moving said first valving element from said minimum-conductance position toward said maximum-conductance position proportional to the portions of said effective driving voltages applied to said force-motor means that are in excess of said effective null voltage; and

electronic control means (**382**), having offsetting means (**622**), and being operatively connected to said force-motor means, for receiving a varying input signal (**410**), for producing a cyclic driving voltage (**406**) whose effective voltage is greater than a predetermined proportional relationship to said input signal by a predetermined effective offset voltage, and for applying said cyclic driving voltage to said force-motor means for use as said effective driving voltage.

4,510,964

VALVE FOR PRESSURIZED CYLINDERS FOR LIQUIFIED GAS

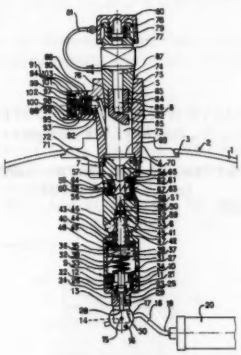
Jean Wendling, 490, Rue Jeanne d'Arc, 67410 Drusenheim (Bas-Rhin), France

Filed Jun. 29, 1983, Ser. No. 509,185

Claims priority, application France, Feb. 9, 1983, 83 02169

Int. Cl.³ F04F *5/54*

U.S. Cl. 137—210 **19 Claims**



1. A valve for a pressurized cylinder for liquified gases, such as butane, propane, and similar gases, comprising in a combination: first safety means for preventing said cylinder from being overfilled with gas in a liquid phase; means for releasing gas in a gaseous phase which is intended for ordinary use; flow shut-off means, which shall close whenever the flow of gas in a gaseous phase exceeds a predetermined level; and second safety means situated ahead of said shut-off means according to the direction in which gas is released, for opening whenever pressure from gas stored within the cylinder exceeds the operating pressure.

4,510,965

ELASTOMER COATED BUTTERFLY VALVE BODY

Bernard Peroux, Toul; Jean Santy, Pont-a-Mousson, and Jean Sutter, Villers les Nancy, all of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Mar. 25, 1982, Ser. No. 361,634

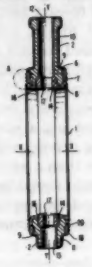
Claims priority, application France, Apr. 27, 1981, 81 08513

Int. Cl.³ F16K *1/22*

U.S. Cl. 137—375 **3 Claims**

1. A butterfly valve body (**1**) for a butterfly valve having an

axle and a control shaft, said body being annular and comprising, diametrically opposed cylindrical passages (12,13) for the axle and the control shaft, said body being completely covered on both its inside and its outside, including the passages (12,13), by a coating (2) molded on the body and made of a flexible single elastomeric material of uniform type and having the



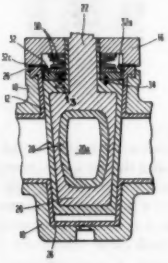
same characteristics and the same hardness at all points of the body (1), said coating forming a single continuous skin over the entire body of the valve, and said coating (2) forming thickened collars (16) in widened cylindrical bores (14) in the radially interior ends of the passages (12,13), and wherein the collars (16) have ends (17) which face the interior of the body (1) and which are spherically concave.

4,510,966

PLUG VALVE WITH FLOATING STEM SEAL

William Parsons, Jr., Boothwyn, Pa., assignor to Garlock, Inc., Longview, Tex.

Filed Mar. 28, 1983, Ser. No. 479,578
Int. Cl.[3] F16K *27/12*
U.S. Cl. 137—375 15 Claims



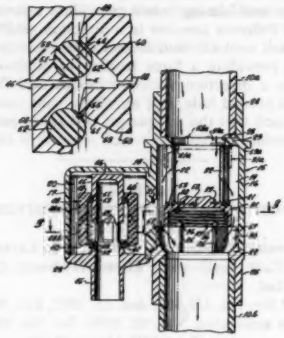
1. In a plug valve of the type comprising a tapered plug biased into engagement with a correspondingly tapered bore formed in a valve body, whereby a seal is formed between said plug and said bore, said plug being rotatable between open and closed positions by means of a stem extending out of said body, a stem seal additionally being provided, the improvement comprising said stem seal being formed by a ring seal member captured in mating annular grooves formed in said plug and in a floating seal member, said floating seal member being biased axially into engagement with said ring seal member and with said plug, whereby axial movement of said plug does not destroy said stem seal, and said ring seal member being biased radially outwardly into engagement with said floating seal member and with said plug.

4,510,967

ANTI-BACKFLOW VALVE FOR THERAPY TUBS AND THE LIKE

Raymond G. Spinnett, Santa Ana, Calif., assignor to KDI American Products, Inc., North Hollywood, Calif.

Filed Jun. 20, 1983, Ser. No. 505,786
Int. Cl.[3] A61H *9/00*
U.S. Cl. 137—389 15 Claims



1. An anti-backflow valve adapted to be installed in a pipe to permit gas flow in one direction and to preclude flow of a liquid in the pipe in the opposite direction, said valve comprising:

(a) a housing having a gas inlet, a gas outlet, and a chamber communicating with said inlet and outlet;

(b) means for preventing fluid flow outwardly through said inlet;

(c) means for venting said chamber in response to a pressure therein greater than a predetermined relief pressure; and

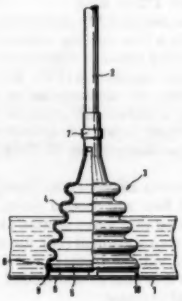
(d) means for draining said chamber in response to the presence of liquid therein above a predetermined level, said means for venting said chamber comprising said means for draining said chamber.

4,510,968

SUCTION DEVICE

Karl Rau, Mühlheim, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 17, 1983, Ser. No. 467,416
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, 3206721; Jul. 27, 1982, 3227929
Int. Cl.[3] F03B *11/00;* F17D *1/00*
U.S. Cl. 137—590 17 Claims



1. In a suction device for a fuel feed unit in a fuel tank, the

suction device having a rigid suction tube, on which tube there is arranged a suction head, the latter being formed with a suction opening provided with a screen and being held under resilient pretension against a bottom of the fuel tank, the improvement wherein

said suction head comprises a conically widening elastic bellows having its large said suction opening facing the bottom,

said screen is arranged at said suction opening,

said screen has a rigid radially directed circumferential edge region snapable into the bellows,

said bellows has an inner wall defining the suction opening of the bellows, and

said inner wall is approximately cylindrical and has a radially directed annular groove, said radially directed circumferential edge region of the screen is joinable into said radially directed annular groove.

4,510,969

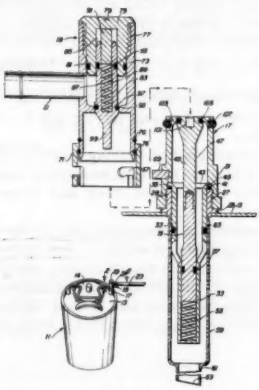
CONNECTOR FOR PRESSURIZED SOURCE OF BEVERAGE CONCENTRATE

Joseph J. Rodth, Pleasant Valley, Conn., assignor to Alco Foodservice Equipment Company, Miami, Fla.

Filed Jan. 15, 1982, Ser. No. 339,717

Int. Cl.³ F16L *37/28*

U.S. Cl. 137—614.05 **1 Claim**



1. A separable connector for releasably securing a pressurized source of concentrate to a line leading to a dispenser valve comprising:

a conduit tube to receive concentrate from the pressurized source;

a first poppet valve retainer mounted in said conduit tube, a larger diameter portion sealingly contacting said conduit tube and a smaller diameter portion extending downwardly into said conduit tube;

a first bias spring located in the bottom of said smaller diameter portion of said first retainer;

a first poppet valve actuating member extending into said smaller diameter portion of said first retainer to contact said first bias spring;

fluid-tight seal means between said first actuating member and said smaller diameter portion;

at least one relatively large opening having sloped sides to minimize congregation of pulpy concentrate extending to the interior of said retainer;

an opening in the end of the larger diameter portion of said retainer having sloped sides;

a first housing in which said first poppet valve retainer is mounted;

a fitting secured to the pressurized source of concentrate, said first housing releasably attached to said fitting;

an extending shoulder at the other end of said first housing forming a first valve seat;

sealing means adjacent the end of said first actuating member away from said first bias spring to engage said first valve seat when said first poppet valve is closed;

a second housing;

a rotatable slip ring mounted on said second housing;

at least one stepped opening formed in said slip ring;

at least one projecting pin on said first housing to fit into said stepped opening to engage said first and second housings;

a second poppet valve retainer releasably fastened in said second housing;

a generally cylindrical opening formed in said second retainer;

a second poppet valve actuating member extending into the opening in said second retainer;

sealing means to preclude concentrate obtaining access to the opening in said second retainer between said second actuating member and said second retainer;

a generally cylindrical opening in said second actuating member extending the major portion of the length of said second actuating member;

a second bias spring located in the opening in said second actuating member;

a plunger located in the opening in said second actuating member over said bias spring;

an extending shoulder on the interior of said second housing forming a second valve seat;

sealing means on the exterior of said second actuating member to engage said second valve seat when said second poppet valve is closed;

a projecting arm on the end of said second actuating member; and

a chamber on the end of said first actuating member to receive said projecting arm on said second actuating member.

4,510,970

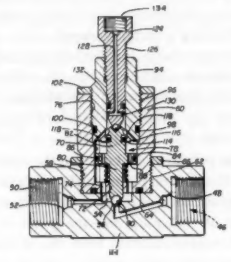
DUAL SEAL IN-LINE TEST VALVE

Terry G. Young, Longview, Tex., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Jan. 10, 1983, Ser. No. 456,900

Int. Cl.³ G01L *27/00*

U.S. Cl. 137—625.4 **4 Claims**



1. A test valve structure for closing a first fluid pressure source acting on a valve means and communicating an alternate fluid pressure source to act on the valve means for testing the valve means comprising;

a. a test valve for positioning between the first fluid pressure source and the valve means to be tested, said test valve including a body having fluid inlet and outlet passageways communicating with a valve chamber having a valve seat therein;

b. an elongated housing secured to said body and having a central bore therein in fluid communication with the valve chamber, the central bore having an enlarged diameter outer bore portion adjacent a restricted diameter inner

bore portion relative to and communicating directly with the valve chamber, said housing having a bottom portion bordering the valve chamber with a plurality of passages circumferentially located about the inner bore portion in fluid communication between the valve chamber and the outer bore portion of the central bore;

c. a piston mounted within the central bore of said housing having inner and outer end portions relative to the valve chamber connected by an intermediate radial flange of an enlarged diameter, the radial flange fitting closely within the enlarged outer bore portion of said housing and having a plurality of circumferentially spaced ports extending through the enlarged portion of the flange with longitudinal axes running generally parallel with the longitudinal axis of the central bore, the inner end portion of said piston fitting closely within the restricted diameter inner bore portion of said housing and having a valve member on its innermost end extending within the valve chamber of said body, said piston being movable between a projected seated position of the valve member on the valve seat within the valve chamber to block fluid flow between the inlet and outlet passageways and a retracted unseated position of the valve member permitting fluid flow between the inlet and outlet passageways;

d. an annular plug mounted within the central bore of said housing outwardly of said piston with respect to the valve chamber having an axial bore extending therethrough and an inwardly bottom planar surface extending radially of the axial bore with a circumferential groove formed therein intermediately between the axial bore and an outer perimeter of said plug, said plug having a plurality of conduits in fluid communication between the axial bore and the circumferential groove, the axial bore receiving the outer end portion of said piston for movement between the seated and unseated positions of the valve member of said piston;

e. a spring mounted within the outer bore portion of said housing and urging said piston continuously into the retracted unseated position of the valve member so that the flow of fluid is maintained between the inlet and outlet passageways through the valve chamber, the radial flange of said piston contacting the bottom planar surface of said plug and forming a metal-to-metal primary seal such that fluid communication is blocked between the ports of said piston and the circumferential groove of said plug to close off fluid communication to the alternate fluid pressure source from the first fluid pressure source, said piston being movable to a seated position of the valve member breaking the primary seal between the radial flange of said piston and the bottom planar surface of said plug such that fluid communication is opened between the circumferential groove of said plug and the ports of said piston to allow fluid communication from the alternate fluid pressure source to the valve means to be tested; and

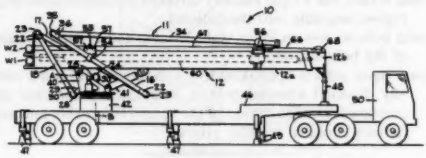
f. an annular sealing means about the outer end portion of said piston adjacent its outermost end providing a secondary seal between said piston and the axial bore of said plug such that when said piston is in its retracted position said annular sealing means is positioned outwardly of the conduit openings in the axial bore to block fluid communication between the conduits and the axial bore of said plug outwardly of said annular sealing means, said annular sealing means being positioned inwardly of the conduit openings in the axial bore when the valve member is seated in the seated position of the valve member to allow fluid communication between the axial bore and the conduits of said plug for testing of the valve means.

4,510,971

CIRCUITRY FOR OPERATING AN EXTENDIBLE BOOM AND A SERVICE LINE

Philip R. Bunnelle, Santa Clara, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Jul. 22, 1983, Ser. No. 516,232
Int. Cl.³ F16L *3/00*; F15B *15/26*
U.S. Cl. 137—615 **13 Claims**



1. A hydraulic circuit for extending and retracting a telescoping service line and for independently extending and retracting a telescoping boom for supporting said service line, said circuit comprising:

a hydraulic ram having first and second input ports, said hydraulic ram being connected to said boom for extending and retracting said boom;

first and second winches each having braking means to lock said winches against rotational movement in a first direction unless a releasing pressure is applied to said means;

first cable means connected between said first winch and an outer end of said service line for extending said service line;

second cable means connected between said second winch and said outer end of said service line for retracting said service line;

means for releasing a first braking means to allow said first winch to rotate in a first direction and to unwind a portion of said first cable means when said boom is being extended; and

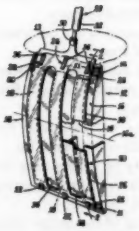
means for applying a pressurized fluid to energize said first winch causing said first winch to apply to take up force to said first cable and for simultaneously applying said pressurized fluid to said second braking means to allow said second winch to unwind said second cable and to extend said service line when said boom is in an extended position.

4,510,972

BOW ACTION VALVE

Richard L. Creedon, San Diego, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Sep. 28, 1982, Ser. No. 425,568
Int. Cl.³ F16K *7/12*
U.S. Cl. 137—625.28 **15 Claims**



1. A flow control valve apparatus for controlling the flow of material comprising

a valve body having a substantially parabolic curved surface with at least one orifice,

resilient plate means comprising a flat metal plate adapted to be bowed into a substantially parabolic curved shape and having two opposite ends and a substantially impervious surface therebetween,

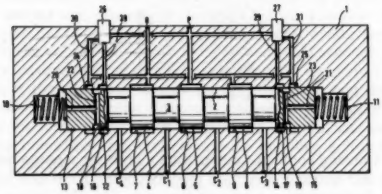
means for mounting said resilient metal plate relative to said valve body with said substantially impervious surface opposite said orifice, with one of said opposite ends secured at a substantially fixed location relative to said valve body, and with the other of said opposite ends free to move relative to said valve body with at least a component of motion in the direction of said substantially fixed opposite end, and

means for applying an endwise compressive force to said metal plate for moving said free opposite end with a component of motion in the direction of said fixed opposite end to bow said resilient plate means so as to alter the curvature of said resilient plate and thereby vary the distance between said substantially impervious surface and said valve body to control the flow of material through said orifice, said metal plate being bowed into a substantially parabolic shape to seal against the substantially parabolic curved surface on said valve body.

4,510,973
HYDRAULIC CONTROL VALVES

Spyros Balaskas, Bremen, Fed. Rep. of Germany, assignor to Vereinigte Flugtechnische Werke GmbH, Bremen, Fed. Rep. of Germany

Filed Dec. 2, 1982, Ser. No. 446,200
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150252
Int. Cl.³ F15B *13/06*
U.S. Cl. 137—625.64 **7 Claims**



2. A control valve having a housing being provided with a bore further having a pair of input ducts being under different pressure and leading to said bore, and still further having a second pair of output ducts there being a slide element slidably disposed in the bore the improvement comprising:

central portions of the slide element and of the bore being constructed for causing the first pair of ducts to be conductively connected to the second pair of ducts at an order depending upon the axial position of the slide element;

the ends of the slide element being constructed as pistons;

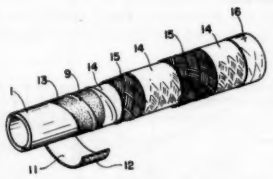
means including a pair of precontrol valves included in the control valve housing and constructed for providing actuating pressure to the slide element for shifting it axially to one side or the opposite side depending upon which one of the precontrol valves is actuated thereby disabling the respective other precontrol valve from applying pressure for shifting the slide element in the opposite direction; and

additional duct means including a secondary output receiving particular pressure conditions upon actuation of one of the precontrol valves as a secondary valve, depending upon the previously attained axial position of the slide element and further dependent upon actuation of one of the precontrol valves as primary control element.

4,510,974
FLUID CONVEYING HOSE

Takeshi Natori; Yoji Kobayashi; Shigetaka Watanabe; Katsumi Shimizu; Ikuei Matsumura; Yoshihiro Namekawa, and Satoshi Miyanaga, all of Ibaragi, Japan, assignors to Hitachi Cable Ltd., Tokyo, Japan

Continuation of Ser. No. 180,176, Aug. 21, 1980, abandoned.
This application Nov. 8, 1982, Ser. No. 440,048
Int. Cl.³ F16L *9/16*
U.S. Cl. 138—137 **10 Claims**



1. A fluid conveying hose comprising:

an inner layer of plastic;

an impermeable layer formed on said inner layer, said impermeable layer being made of a material which is lower in fluid permeability than that of said inner layer, said impermeable layer comprising a plastic film having an overlapping seam and having a surface which is integrally evaporated with a metal film;

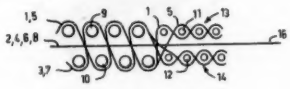
a first plastic coating layer and a first reinforcing layer of fibers formed on said impermeable layer; and

an outermost coating means adapted to resist battery acid and comprising a battery acid resistant material.

4,510,975
WOVEN FRINGED TEXTILE PRODUCT AND A METHOD FOR MAKING SAID MANUFACTURING PRODUCT

Heimo K. Ojanperä, Kp 5, 62900 Alajärvi, Finland

Filed Mar. 31, 1983, Ser. No. 480,708
Claims priority, application Finland, Apr. 5, 1982, 821190
Int. Cl.³ D03D *3/00*
U.S. Cl. 139—384 R **2 Claims**

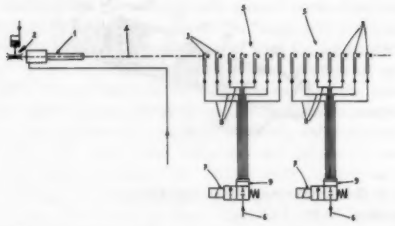


1. A woven textile product having fringes on the edges and, on each side of a plane defined by supporting warp threads, weft threads which are bound to each other by means of binding warp threads crossing said plane, edges of the product being provided with two adjoining edge strips which are folded over to form a selvedge, said edge strips being formed such that in the edge area of the product, a part of the binding warp threads binds the weft threads on one side of said plane defined by the supporting warp threads to each other and the remainder of the binding warp threads binds the weft theads on the opposite side of said plane to each other, the supporting warp threads not included in said edge strips extending between said edge strips beyond said selvedge as fringes.

4,510,976
FLOW DISTRIBUTOR FOR FLUID CIRCUIT AND ITS APPLICATION TO SHUTTLELESS LOOMS WITH PNEUMATIC INSERTION OF THE WEFT

Albert H. Deborde, and Gilles Grandvallet, both of Bourgoin Jallieu, France, assignors to Saurer Diederichs (Societe Anonyme), Bourgoin Jallieu, France

Filed Oct. 13, 1983, Ser. No. 541,669
Claims priority, application France, Oct. 26, 1982, 82 18360
Int. Cl.³ D03D *47/30*
U.S. Cl. 139—435 **12 Claims**

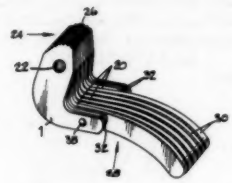


1. A flow distributor for a compressed air fluid circuit, comprising a body of revolution with an annular inner chamber defined by an inner circumferentially continuous conical wall and an outer circumferentially continuous frustoconical wall centered on a common axis, the annular chamber connecting a fluid inlet orifice disposed along said axis at one end of said body opposite the point of the conical wall, said body being provided with a plurality of axial outlet passages distributed in a circular array concentrically and at regular angular intervals around the central axis at an opposite end of said body remote from the central inlet orifice and communicating directly with said chamber.

4,510,977
APPARATUS FOR APPLYING A FORCE

John E. Crowley, Boulder, Colo., assignor to Houdaille Industries, Inc., Ft. Lauderdale, Fla.

Filed Jul. 21, 1983, Ser. No. 515,593
Int. Cl.³ B21F *9/00*
U.S. Cl. 140—123 **3 Claims**



1. Apparatus for applying a substantially equal force to an object comprising:

a fixed base having a slot adapted to support an object having longitudinal and transverse directions;

cam gripping means comprising a plurality of levers;

means pivotally mounting said plurality of levers on said fixed base;

each of said levers having a portion extending from said pivot means in one direction, each of said portions having a gripping surface which in operative position faces said slot of said fixed base;

each of said levers having an arm extending from said pivot means in a direction opposite to said one direction so that an independent force may be selectively applied to each of said arms to pivot each of said levers around said pivot means and to move said gripping surface of each of said portions toward said slot of said fixed base to apply said force to an object which may be supported therein; and

said pivot means holding said arms in an assembled relationship but permitting relative movement between said arms to compensate for uneven wear of said gripping surfaces on said portions comprising:

means defining an opening in each of said arms;

a pin extending through each of said openings;

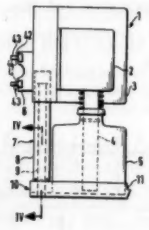
means adjacent each end of said pin for holding said pin in its relationship extending through said openings; and

said pin having a cross-sectional area substantially less than the cross-sectional area of each of said openings so that said pin is loosely fitted in each of said openings so that said arms may be moved relative to each other in response to said force.

4,510,978
DOSING APPLIANCE

Hans Arens, Wertingen, Fed. Rep. of Germany, assignor to Grunbeck Wasseraufbereitung GmbH, Hochstadt, Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,268
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210839
Int. Cl.³ B65B *31/06*
U.S. Cl. 141—65 **18 Claims**



18. A dosing appliance comprising a housing; a pump means within said housing; a suction pipe extending from said pump means downwards out of said housing; fastening means for fixedly mounting said housing; and supporting means for supporting a dosing-medium vessel, wherein said supporting means comprises a supporting element for receiving the dosing-medium vessel and a supporting device extending downwards from said housing and connecting said supporting element with said housing, wherein the length of said supporting device is adjustable, whereby the distance of said supporting element from said suction pipe may be adjusted to a predetermined value and wherein said supporting element is adjustable to a first position, in which the distance between said supporting element and said suction tube is at least equal to the height of a dosing-medium vessel to be received, and to a second position, in which said suction tube extends sufficiently far into said dosing-medium vessel, said supporting device comprising a guide tube fixedly connected to said housing and a moveable tube slideable in said guide tube, a guide part connected to said guide tube, said guide part having two engagement noses which project on opposite sides, sloping planes extending from the bottom upwards in relation to one another and horizontal retaining planes, said supporting element having first and second pivotal latches having pawls, said pawls interacting with said engagement noses to lock said supporting means in a fixed position, and said latches being pivotally moveable to permit movement of said supporting means.

4,510,979

APPARATUS FOR CONTROLLING THE INFLATION OF TIRES

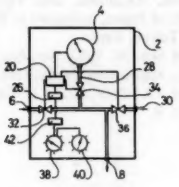
Arne Hjorth-Hansen, Virringvej 2, DK-8660 Skanderborg, Denmark

Filed May 24, 1983, Ser. No. 497,600

Claims priority, application PCT Int'l Appl., May 24, 1982, PCT/DK82/00047

Int. Cl.³ B60C *23/00*

U.S. Cl. 141—95 **7 Claims**



1. An apparatus for inflating pneumatic tires by first inflating a tire to a predetermined overpressure and then bleeding it to a desired tire pressure, comprising an inlet and an outlet for pressurized air and pressure regulating means mounted therebetween, said outlet being connectable with a tire, the pressure regulating means comprising a pressure gauge and switch valve means, which are controlled by a timer so as to alternatingly, during the inflation, connect the said outlet with the said inlet and the pressure gauge, respectively, to thereby produce alternating inflation periods and measuring periods, until the attainment of the predetermined overpressure is detected by the pressure gauge, which is operatively connected with control means for causing the switch valve means to alternatingly connect the said outlet with the pressure gauge and an exhaust opening, respectively, in response to said attainment to produce alternating bleeding periods and measuring periods until the desired tire pressure is detected by the pressure gauge, wherein the improvement comprises selector means for reading in the volume of the tire to be inflated, said selector means being operatively connected with the said timer in such a manner that the timer causes the length of the said inflation periods to be variably adjusted substantially in accordance with the read in volume of the tire, and wherein said selector means comprises separate selectors for enabling a direct reading in the diameter and width of said tire.

4,510,980

TABLE ASSEMBLY FOR A MULTIPURPOSE TOOL

Robert L. Bartlett, Dayton, and Robert N. McKee, Huber Heights, both of Ohio, assignors to Shopsmith, Inc., Dayton, Ohio

Filed Nov. 16, 1983, Ser. No. 552,599

Int. Cl.³ B21C *9/02*

U.S. Cl. 144—1 C **14 Claims**

14. In a multipurpose tool of the type having a frame, a pair of parallel way tubes mounted on said frame, and a headstock slidably mounted on said tubes, said headstock having a motor-driven quill spindle spaced from and parallel to said tubes, the improvement comprising:

a plate-shaped table top;

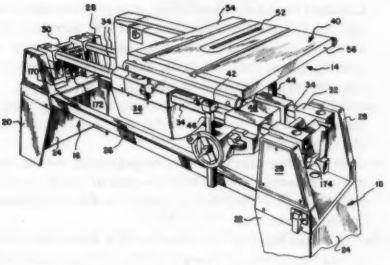
pivot means attached to an underside of said table top and defining a pivot axis which extends transversely of said table top and said way tubes, such that said table top may be pivoted in a tilted mode to lie in a plane perpendicular to a rotational axis of said quill spindle;

a pair of parallel, cylindrically-shaped support legs attached to and extending downwardly from said pivot means, each of said legs having a pair of toothed racks extending along opposing longitudinal sides thereof;

a carriage slidably mounted on said way tubes and having a pair of channels spaced transversely thereof and shaped to receive said support legs therethrough, and a pair of pinion gears associated with said holes, each positioned to mesh with one of said racks on an associated one of said legs whereby said legs may be removed from said holes so that said racks disengage said pinions, said table and legs reversed relative to said carriage, and said legs reinserted into said holes so that opposite ones of said racks engage said pinions;

crank means for rotating and selectively locking said pinion gears to displace said table top relative to said carriage;

said table top having first and second transverse edges at opposite ends thereof, and a transverse slot therethrough shaped to receive a tool mounted on said quill spindle and



spaced from said first edge a distance less than a clearance distance from a top of said carriage to said quill spindle, and spaced from said second edge a distance greater than said clearance distance; and

means for pivotally attaching said way tubes to said frame such that said tubes may be pivoted about ends thereof to a substantially vertical position and said table top pivoted to said tilted mode such that said headstock is above said table top, whereby said tool is in a vertical drill press mode; and said tubes may be pivoted about opposite ends thereof to a substantially vertical position and said table top and legs reversed in orientation relative to said carriage such that said headstock is below said table top, whereby said tool is in an under-the-table shaping mode.

4,510,981

SELF-CENTERING FEEDING DEVICE

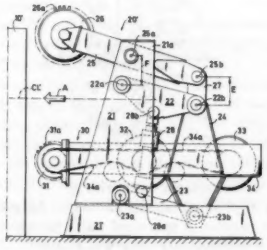
Sven-Olov Biller, Söderhamn, Sweden, assignor to KOCKUMS Industri AB, Söderhamn, Sweden

Filed Sep. 20, 1982, Ser. No. 420,692

Claims priority, application Sweden, Dec. 21, 1981, 8107654

Int. Cl.³ B27C *1/12*

U.S. Cl. 144—246 F **10 Claims**



1. A device for feeding elongated objects such as logs into a processing machine having a center line (C_L') about which processing functions are carried out, said elongated objects

being centered relative to said center line at least vertically, said feeding device including a vertically extending stand member, a horizontally extending, vertically adjustable conveyor means mounted in said stand member including pivotally attached carrier means, a rotatable engagement means adapted to engage from above an object on said conveyor means, said engagement means being mechanically coupled to said carrier means for movement through the same distance above said center line as the conveyor means is moved thereunder, and a driving means, supplied by energy from an outer source, for lifting the conveyor means towards said center line, said feeding device comprising;

two elongate link members having first and second ends, said link members both extending in the same direction from said stand member and having said first ends pivotally attached to the stand member, at a predetermined vertical spacing (a) one from another, said link members pivotally carrying at said second ends, having the same vertical spacing (a) as the first ends, said carrier means to which the conveyor means is firmly attached,

parallel means, including a stationary portion located on said stand member, for vertically adjustably carrying said conveyor means,

an arm member carrying said engagement means, said arm member being pivoted to the vertical stand member and extending in a direction opposite to the direction of said link members, and

sensor means having the function of a limit switch for triggering the supply of energy to the driving means when the leading end of said conveyor means-supported object has reached a position beneath said engagement means, said sensor means including means for discontinuing the supply of energy when the trailing end of the object has passed said position,

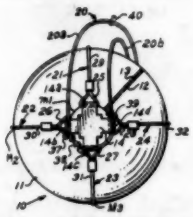
said conveyor means-supported object being positively clamped between the conveyor means and the engagement means during the entire feeding procedure by the force generated by the driving means, and having its longitudinal center line centered relative to said processing machine center line when said leading end of said conveyor means-supported object reaches said processing machine.

4,510,982

BALL CARRIER SYSTEM

Roberto Sangroni, 1570 E. New York Ave., Brooklyn, N.Y. 11212

Filed Oct. 31, 1983, Ser. No. 546,946
Int. Cl.³ A63B 47/00; A45C 3/12, 13/26
U.S. Cl. 150—52 A **15 Claims**



1. A ball carrier system, comprising:

a ball bag of pliable material having an opening and configured to receive a spherical ball therein and thereupon assume a substantially spherical shape;

a first cord for carrying the ball bag; and

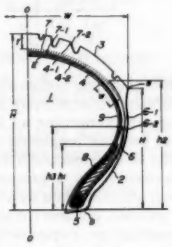
means connecting the first cord to the ball bag comprising a plurality of cords on the spherical outside surface of the ball bag extending along major circles from a first common minor circle to a diametrically opposite second common minor circle.

4,510,983

PAIR OF PNEUMATIC BELTED TIRES FOR MOTORCYCLE

Shinichiro Ohkuni, Akishima, and Yoichi Kitazawa, Higashiyamato, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sep. 30, 1983, Ser. No. 537,608
Claims priority, application Japan, Oct. 18, 1982, 57/182623
Int. Cl.³ B60C 9/20, 15/04, 9/08
U.S. Cl. 152—361 R **13 Claims**



1. A motorcycle having a front tire and a rear tire defining a pair of pneumatic belted tires, each tire comprising; a tread, a pair of sidewalls toroidally extending from said tread, a pair of bead portions each located at each radially inward edge of said sidewalls and containing a bead core therein, a carcass wrapped around said bead core from inside toward outside to reinforce the tread and sidewalls and composed of at least one rubberized ply containing organic fiber cords inclined at an angle of 50°–90° with respect to the equatorial plane of each tire, said tread being extended between said sidewalls up to both portions corresponding to the maximum width of each tire at substantially an equal thickness or that thickness which slightly reduces from the tread center toward both sidewalls, and a belt disposed between said tread and said carcass at a width substantially corresponding to a tread width and composed of at least two rubberized plies each containing cords with a modulus of elasticity of at least 600 kg/mm^2 arranged at a certain inclination angle with respect to the equatorial plane of each tire, the rear tire having a section height and a section width larger than those of the front tire, said cords crossed with each other, and an inclination angle α of cord in said belt of the rear tire for a rear wheel of the motorcycle and an inclination angle β of cord in the belt of the front tire for a front wheel of the motorcycle satisfy the following relationship:

$$(\alpha-\beta)\geqq 4°$$

when

$$15°\leqq\alpha\leqq 26°,$$

or

$$(\alpha-\beta)\geqq -0.3\alpha+11.8°$$

when

$$26°\leqq\alpha\leqq 36°.$$

4,510,984
PNEUMATIC RADIAL TIRE HAVING DURABLE BEAD STRUCTURE

Katsuji Kishida, Takatsuki; Tetsuto Ueno, Hyogo; Masakazu Onishi, and Keijiro Oda, both of Kawanishi, all of Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed Jun. 22, 1982, Ser. No. 390,921
Claims priority, application Japan, Jun. 24, 1981, 56-98839
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.
Int. Cl.³ B60C *15/06*
U.S. Cl. 152—362 CS **4 Claims**

1. A pneumatic radial tire comprising:

one or more carcass ply layers of steel cords extending from one bead portion to another bead portion across a crown portion and disposed at an angle of 90° relative to the equatorial line of the tire whose opposite ends being turned up around a respective annular bead core from the inside to the outside and terminating at the bead region;

a reinforcing strip of steel cords positioned axially outwardly adjacent to the turn-ups of carcass plies and extending radially outwardly beyond the turn-ups;

a bead filler of approximately triangular sectional shape consisting of high hardness rubber stock of approximately triangular sectional shape and medium hardness rubber stock with a shore hardness of 55° to 70° having a radial dimension longer than that of the high hardness rubber stock and positioned axially outwardly adjacent to the high hardness rubber stock and being disposed at the region enclosed by the carcass plies, the turn-ups of the carcass plies and the reinforcing strip of steel cords with a top portion extending to an upper portion of a side wall;

a cap of organic textile cord fabric covering an upper end of the reinforcing strip of steel cords; and

a fin-shaped rubber buffer having a shore hardness lower than that of the medium hardness rubber stock by 3° to 20° disposed radially outwardly of the capped end and axially outwardly adjacent to the medium hardness rubber stock.

4,510,985
STACKED OPEN BOTTOM TEMPORARY GUIDE BASE FOR OFFSHORE DRILLING

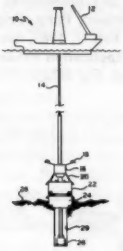
Robert C. Arnim, II, Borger, Tex., and Gregory D. Bourne, London, England, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 20, 1983, Ser. No. 534,060
Int. Cl.³ E21B *7/128*
U.S. Cl. 175—7 **19 Claims**

1. A temporary guide base assembly comprising:

(a) at least one lower box having vent pipe means and having a central hole adapted to receive casing, said at least one lower box being closed on the sides and top except for said central hole and being open at the bottom;

(b) an upper box in stacked relationship with said at least one lower box, said upper box having vent pipe means and having a central hole adapted to receive casing, said upper box being closed on the sides and top except for said central hole and being open at the bottom; and

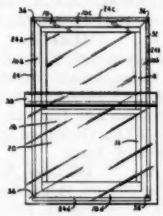


(c) a seal pad around said central hole of each of said at least one lower boxes.

4,510,986
MAGNETICALLY ATTACHED STORM WINDOWS AND THE LIKE

Rose M. Schwankl, 9604 W. 106th St., Overland Park, Kans. 66212

Continuation of Ser. No. 173,969, Jul. 31, 1980,. This application Nov. 26, 1982, Ser. No. 444,660
Int. Cl.³ A47H *23/01;* **E06B** *3/28*
U.S. Cl. 160—354 **4 Claims**



1. A method of releasably attaching an aperture covering panel to a frame surrounding the aperture; said method comprising the steps of:

(a) selecting a continuous and generally planar surface on said frame enclosing said aperture;

(b) providing first and second strips, each strip having an adhesive side and an opposite magnetic side, said magnetic side having spatially alternating north and south magnetic poles thereon;

(b) applying the adhesive side of said first strip to a first of said surface or said panel in a pattern to generally continuously surround said aperture;

(c) positioning the magnetic side of said second strip on the magnetic side of said first strip such that said second strip is generally coextensive with said first strip;

(d) adjusting said second strip in relation to said first strip to position the magnetic poles of said second strip in registration with opposite magnetic poles of said first strip to maximize the magnetic attraction between said first and second strips; and

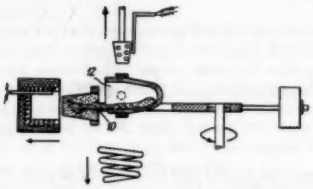
(e) thereafter placing a second of said surface or said panel in contact with the adhesive side of said second strip such that said panel is removably held so as to cover said aperture by the magnetic attraction between the magnetic sides of said first and second magnetic strips.

4,510,987

METHOD AND APPARATUS FOR CASTING METAL ALLOYS IN THE THIXOTROPIC STATE

Jean Collot, Antibes, France, assignor to Association pour la Recherche et le Developpemente des Methods et Processus Industrieles (Armines), Paris, France

Filed Feb. 7, 1983, Ser. No. 464,403
Claims priority, application France, Feb. 12, 1982, 82 02344
Int. Cl.³ B22D *27/08, 13/00*
U.S. Cl. 164—71.1 13 Claims



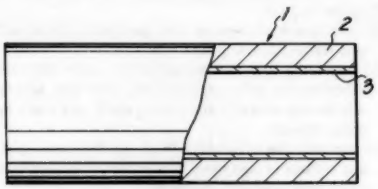
1. A method of casting a metal alloy in a thixotropic state, said method comprising the steps of agitating said alloy in a crucible to render said alloy thixotropic, and then transferring said thixotropic alloy from said crucible directly into a mold by virtue of centrifugal force produced by rotating said crucible and said mold.

4,510,988

TUBE FOR THERMAL CRACKING OR REFORMING HYDROCARBON AND MANUFACTURING METHOD THEREOF

Keizo Konoki, Takaidohigashi; Takanobu Shinohara; Ikuyoshi Kochi, both of Chiba; Keiichi Shibata, Mobara; Hisakatsu Nishihara, Hirakata; Toshiaki Morichika, Hirakata; Junichi Sugitani, Hirakata, and Koji Tsuchida, Hirakata, all of Japan, assignors to Kubota Ltd., Osaka and Toyo Engineering Corporation, Tokyo, both of, Japan

Filed Aug. 17, 1982, Ser. No. 408,820
Claims priority, application Japan, Aug. 21, 1981, 56-131899; Aug. 21, 1981, 56-131900; Aug. 21, 1981, 56-131901
Int. Cl.³ B22D *19/08*
U.S. Cl. 164—102 17 Claims



1. A method of manufacturing reactor tube for thermally cracking or reforming a hydrocarbon characterized by;

casting tube member from molten Fe-Cr-Ni heat resisting steel by means of centrifugal casting, and

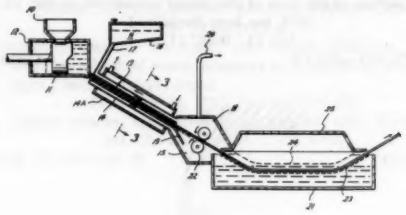
scattering self-fluxing alloy powder free from or with a low Ni content on the inner surface of tube body during such stage when the inner surface of the tube member has solidified but high temperature in the tube member is retained, the self-fluxing alloy being molten by the heat of the cast tube member and layer of self-fluxing alloy being formed over and fused to the inner surface of the tube member.

4,510,989

PRODUCTION OF METAL RODS

Frederic C. Mayer, 1407 W. Brooklake Dr., Houston, Tex. 77077

Continuation of Ser. No. 246,675, Mar. 23, 1981, abandoned.
This application Oct. 21, 1983, Ser. No. 543,235
Int. Cl.³ B22C *21/02, 11/00*
U.S. Cl. 164—415 7 Claims



1. Apparatus for continuously pressure casting metal rods, comprising a press to receive the metal in a molten state, an elongate tube having an inlet at one end connected to the press and an inner lining of a heat resistant material having a low coefficient of friction with respect to the metal and through which the molten metal from the press may be forced to form a continuous rod, a sheath of highly heat conductive material about the lining, a housing of highly heat conductive material surrounding the sheath to form a first annular space thereabout extending along a substantial portion of the length of the tube, means for supplying a cooling medium to one end of the first annular space near the tube inlet, a jacket surrounding the housing to provide a second annular space between them, means for circulating water through the second annular space, and a bath of molten metal having an enclosure above the bath, and an inlet to the enclosure connected to the end of the housing so that the rod may pass from the housing into the enclosure and the cooling medium may circulate from the first annular space about the tube into the enclosure above the bath, and means within the bath to guide the rod into and through the molten bath metal in a straight, substantially horizontal path, said bath also having an outlet from the enclosure through which the rod may emerge and the cooling medium may pass upon circulating through the enclosure.

4,510,990

CONTINUOUS CASTING APPARATUS WITH SHRINKAGE COMPENSATION

Gerd Artz, Ratingen; Dieter Figge, Essen, and Clemens Philipp, Meerbusch, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

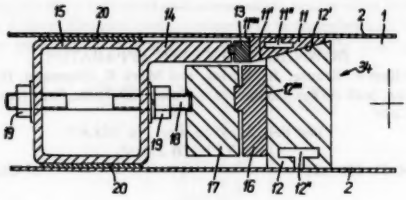
Filed Aug. 30, 1983, Ser. No. 527,949
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1982, 3232147
Int. Cl.³ B22D *11/10*
U.S. Cl. 164—431 19 Claims

1. A continuous casting apparatus for a metal casting arranged to compensate for shrinkage of the casting in a cross sectional plane of the casting normal to the casting direction, said apparatus comprising:

a pair of endless casting belts each spaced from and facing the other to form respective mold walls and arranged for movement in the casting direction;

a pair of endless articulated mold walls each spaced from and facing the other, disposed between said casting belts and arranged to move with said casting belts in the casting direction, the spacing between said articulated mold walls and between said casting belts being greater upstream than downstream relative to the casting direction, wherein each said articulated mold wall includes a plurality of dam

blocks, each said dam block has an inner face disposed at an angle relative to said casting belts and defining a surface of the casting transverse to said casting belts and an outer face disposed at an angle relative to said casting belts



and facing a direction opposite to that of said inner face, and at least one of the faces of each said dam block is adjustable in height between said casting belts; and

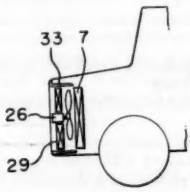
guide means for adjusting the height of said at least one face of each said dam block.

4,510,991

HEAT EXCHANGER AND FAN MOTOR IN A FRONT WHEEL DRIVE VEHICLE

Hiroto Kawahira, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,442
Claims priority, application Japan, May 31, 1982, 57-92847
Int. Cl.³ F28F *3/02*
U.S. Cl. 165—41 **8 Claims**



1. A front-wheel drive motor vehicle comprising:

(a) a horizontal engine, said horizontal engine being mounted at at least substantially a right angle with respect to the moving direction of said motor vehicle;

(b) an exhaust manifold operatively associated with said horizontal engine;

(c) a radiator located adjacent to said horizontal engine and to said exhaust manifold, said radiator being located to one side of said horizontal engine with respect to the moving direction of said motor vehicle; and

(d) a heat exchanger unit located adjacent to said radiator but spaced therefrom in the moving direction of said motor vehicle, said heat exchanger unit comprising:

(i) a plurality of flat pipes in at least substantially circular form provided with passages for coolant inside thereof, said flat pipes being concentrically arranged, being radially spaced from one another, and having an axial central space within the innermost one of said plurality of flat pipes;

(ii) an inlet header connected to the inlets of each of said plurality of flat pipes;

(iii) an outlet header connected to the outlets of each of said plurality of flat pipes;

(iv) corrugated heat exchanger fins interposed in at least some of the spaces between said plurality of flat pipes, said heat exchanger fins being in thermal contact with adjacent ones of said plurality of flat pipes and being at least generally coplanar with said plurality of flat pipes;

(v) a fan motor positioned in said axial central space, said fan motor having a rotory shaft which extends axially outwardly of said plurality of flat pipes and said corrugated heat exchanger fins; and

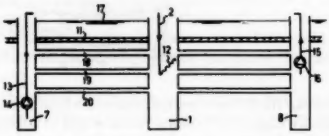
(vi) a propeller fan mounted on said rotory shaft and sized and position to draw cooling air between said radially spaced flat pipes and over said corrugated heat exchanger fins.

4,510,992

SOLAR ENERGY SYSTEM

Jón Kristinsson, 10 Noordenbergsingel, Deventer, Netherlands

Continuation of Ser. No. 187,225, Sep. 15, 1980, abandoned, which is a continuation of Ser. No. 890,338, Mar. 27, 1978, abandoned. This application Sep. 20, 1983, Ser. No. 533,978
Claims priority, application Netherlands, Apr. 5, 1977, 7703701
Int. Cl.³ F24J *3/02*
U.S. Cl. 165—45 **7 Claims**



1. A heat storage system for a building, comprising a plurality of networks of imperforate-walled plastic ducts for conveying a fluid heat transfer medium, said ducts being embedded in the ground beneath the building whereby the heat transfer medium passes through the ducts in thermally-conductive contact therewith and heat may thereby be delivered for storage in the ground and subsequently removed from storage for use, each network being positioned in a horizontal plane and said networks each having different temperature being disposed in the ground at different vertical levels, to utilize a stratification of the earth temperature, so that each said network positioned at a higher vertical level having a temperature substantially higher than a temperature of said network positioned at a lower vertical level, and said system also comprising a sealing layer of thermally insulating material disposed above said networks and extending thereover, and an input riser, for introducing heat transfer medium into said networks, and at least one output riser, for withdrawing heat transfer medium from said networks, each of said risers being in open communication with all of the networks and the input riser being distant from each output riser so as to avoid direct heat exchange between heat transfer medium entering and leaving said networks.

4,510,993

FLOW CONTROL APPARATUS AND METHOD

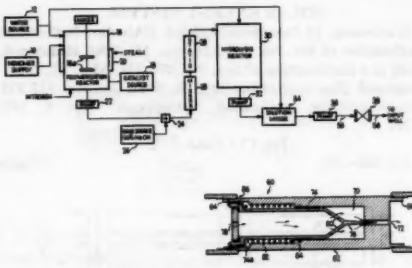
Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Mar. 25, 1982, Ser. No. 361,622
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—75 R **7 Claims**

1. Apparatus for use in transporting an aqueous solution of a polyacrylamide to be used as a drive fluid and/or mobility buffer in the secondary or tertiary recovery of oil from an oil-bearing subterranean formation, said apparatus including a polymerization reactor for polymerizing an aqueous solution of an acrylamide monomer and a hydrolysis reactor in communication with the polymerization reactor for hydrolyzing the polyacrylamide produced in the polymerization reactor, and dilution means in communication with a source of water, said dilution means having an inlet in communication with the hydrolysis reactor and an outlet, the improvement comprising:

conduit means in communication with the outlet of the dilution

means for conveying diluted aqueous hydrolyzed polyacrylamide solution from the dilution means to storage means or to an input well of an oil-bearing subterranean formation; and flow control means in said conduit means and across which a substantial fluid pressure differential exists in said conduit means, said flow control means being located downstream with relation to the dilution means and upstream with relation to said storage means or said input well of the oil-bearing subterranean formation, said flow control means including a



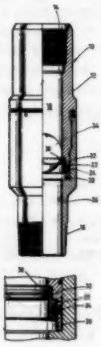
needle valve-like fluid flow control element which is movable to a substantially fluid flow limiting position and to a fluid flow open position, said needle valve-like fluid flow control element in its fluid flow open position enabling the diluted aqueous hydrolyzed polyacrylamide solution from the dilution means to undergo, a substantial lowering in fluid pressure as it flows across the flow control means while at the same time substantially preventing shear degradation of the hydrolyzed polyacrylamide comprising said diluted aqueous hydrolyzed polyacrylamide solution.

4,510,994

PUMP OUT SUB

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Apr. 6, 1984, Ser. No. 597,285
Int. Cl.³ E21B *34/10*
U.S. Cl. 166—156 **8 Claims**



1. A pump out sub for use in a well tubing for receiving a plug for sealing the tubing and applying pressure to the tubing and thereafter pumping out the plug comprising,

a tubular body adapted to be connected in the well tubing, said body including a recess,

shearable means positioned in the recess,

an expandable seat positioned in the body above and supported from the shearable means whereby when the plug is seated on the seat pressure may be applied to the tubing and when sufficient pressure is applied to the plug the shearable means and the seat moves downwardly and the seat expands into the recess.

4,510,995

DOWNHOLE LOCKING APPARATUS

William F. Krause, Jr., Spring, and Mark E. Hopmann, Houston, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Feb. 22, 1983, Ser. No. 468,421
Int. Cl.³ E21B *23/02*
U.S. Cl. 166—217 **17 Claims**

1. A lock for anchoring a well tool in a nipple in a subterranean well, comprising:

radially expandable locking dog means for engaging the nipple;

an inner mandrel axially movable relative to the locking dog means and having a surface engaging the locking dog means upon relative axial movement to radially shift the locking dog means;

an outer housing surrounding the inner mandrel;

an inwardly biased member engaging the inner mandrel and the outer housing when inwardly flexed to prevent relative movement therebetween when the locking dog means are expanded; and

at least one radially extending opening extending through the inner mandrel aligned with the inwardly biased member, whereby the inwardly biased member is expanded when engaged by a releasing member expanding through the radially extending opening to release the inner mandrel for axial movement relative to the outer housing, the locking dog means being freed for retraction to release the lock.

4,510,996

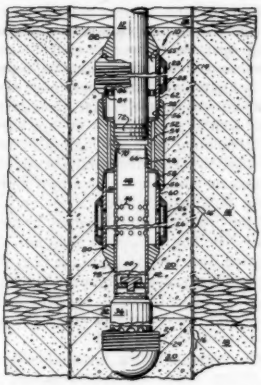
WELL SCREEN ASSEMBLY WITH LONGITUDINALLY PORTED CONNECTOR SUB

James R. Hardin, Lafayette, La., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 3, 1983, Ser. No. 538,727
Int. Cl.³ F21B *43/08*
U.S. Cl. 166—227 **4 Claims**

1. A well screen assembly comprising a plurality of vertically spaced screen sections having internal support pipes and being adapted to be positioned in a well between a pair of spaced gravel packs, said assembly including at least a pair of upper and lower screen sections which are joined by an axially elongated, generally cylindrical connector sub having end

openings and relatively large diameter threaded end wall portions at each of its ends to which said screen sections are joined, said connector having an intermediate wall portion located between said end openings which is substantially thicker than the end wall portions surrounding said end openings, the inner surface of said intermediate wall portion including a lower threaded portion adapted to be threaded to at least one pipe which is adapted to be concentrically positioned



within and radially inwardly spaced from the lower one of said screen sections, said intermediate wall portion having longitudinal ports formed therein in a direction parallel to the connector axis, said ports being located so as to permit fluid to flow through the connector from a radial annular space which is inboard of said lower screen section attched to the lower end of the connector and outboard of said at least one pipe to a similar annular space which is inboard of a second screen section attached to the upper end of the connector.

4,510,997

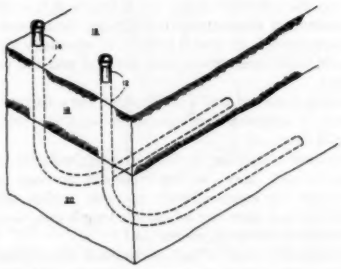
SOLVENT FLOODING TO RECOVER VISCOUS OILS

John L. Fitch, Dallas, and Lynn D. Mullins, De Soto, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 308,755, Oct. 5, 1981, abandoned. This application Oct. 25, 1983, Ser. No. 544,814

Int. Cl.[3] **E21B** *43/22*

U.S. Cl. 166—263 **7 Claims**



1. A method of recovering viscous oil from a subterranean viscous oil-containing formation having no significant vertical permeability barrier therein comprising the steps of:

(a) providing at least one injection well extending downwardly from the earth's surface to the bottom of said oil-containing formation and then extending outwardly a substantial distance through said formation in a generally straight horizontal direction;

(b) providing at least one production well extending downwardly from the earth's surface to the bottom of said oil-containing formation and then extending outwardly a substantial distance through said formation in a generally straight horizontal direction;

(c) said production well being spaced from said injection well and the generally straight horizontal portion of said production well being generally at the same level as, and being generally parallel to, the generally straight horizontal portion of said injection well;

(d) said injection well and said projection well being in fluid communication with the formation over the distance of each well extending through said formation in a generally straight horizontal direction;

(e) injecting a predetermined amount of hydrocarbon solvent into the formation via said injection well, said solvent having a specific gravity less than the specific gravity of the oil contained in the formation and a viscosity not greater than 1/100 the viscosity of the oil contained in the formation under formation conditions and recovering fluids including oil from the formation via said production well;

(f) thereafter, shutting-in said injection well and said production well to permit said formation to undergo a soak period for a predetermined period of time wherein the solvent mixes with the oil in the formation by gravity-driven convection to reduce the viscosity of the oil; and

(g) thereafter injecting a driving fluid into the formation via said injection well and recovering fluids including oil of reduced viscosity from said formation via said production well until the fluid being recovered from the production well comprises an unfavorable amount of driving fluid.

4,510,998

FLUID LOSS ADDITIVE FOR WELL DRILLING

Dennis G. Peiffer, East Brunswick; Robert D. Lundberg, Bridgewater, both of N.J., and Thad O. Walker, Humble, Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 374,252, May 3, 1982, abandoned. This application Nov. 30, 1983, Ser. No. 556,398

Int. Cl.[3] **E21B** *33/138*

U.S. Cl. 166—295 **18 Claims**

1. A process for plugging the pores of a porous formation of a well with a water-in-water pseudo-emulsion solution having a viscosity of at least about 50 cps which includes the steps of:

(a) forming a solvent system of an organic liquid and a polar cosolvent, said polar cosolvent being less than about 15 weight percent of said solvent system, a viscosity of said solvent system being less than about 100 cps;

(b) dissolving a water insoluble, neutralized sulfonated polymer in said solvent system to form a solution, a concentration of said unneutralized or neutralized sulfonated polymer in said solution being about 0.01 to about 0.5 weight percent, a viscosity of said solution being less than about 200 cps;

(c) adding about 5 to about 500 volume percent water to said solution, said water being immiscible with said solution, with said polar cosolvent and said water insoluble, neutralized sulfonated polymer transferring from said organic liquid to said water causing the viscosity of said water to increase to at least 50 cps to form said water-in-water pseudo-emulsion solution;

(d) injecting said water-in-water psuedo-emulsion solution into said well having said porous formation; and

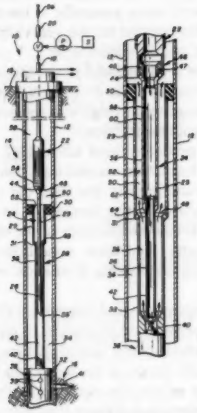
(e) penetration of said porous formation by the water-in-water pseudo-emulsion solution to plug the pores of said porous formation of said well.

4,510,999

WELL CLEANUP AND COMPLETION METHOD AND APPARATUS

Flint R. George, Katy, Tex., and Emmet F. Brieger, Albuquerque, N. Mex., assignors to Geo Vann, Inc., Houston, Tex.

Filed Jun. 7, 1982, Ser. No. 385,708
Int. Cl.³ E21B *43/11*
U.S. Cl. 166—297 **9 Claims**



1. Method of completing a formation located downhole in a cased borehole comprising the steps of:

(1) connecting a casing gun in underlying relationship relative to a packer device and suspending the gun adjacent to a formation to be completed;

(2) forming a passageway from the gun to the packer, and placing a gun firing device within the passageway;

(3) forming a seal housing within said passageway; running a seal assembly having an attached extension tube downhole on the end of a tubing string such that the extension tube is positioned within the seal housing and forms an annulus therebetween;

(4) forming a flow path which extends from the surface of the ground, down through the tubing string, to said gun firing device, back up the annulus formed between the seal housing and extension tube, up the upper annulus between the casing and the tubing string, and to the surface of the ground, and flowing a washing fluid through the flow path thereby washing debris from about the firing device;

(5) seating the seal assembly within the seal housing; isolating the seal housing annulus from the upper annulus by lowering the tubing string until the seal assembly is seated within the seal housing;

(6) perforating the formation by passing a gun firing device actuator downhole through the tubing string to the gun firing device; and

(7) producing the well by flowing the production from the formation, into the lower borehole annulus, into the seal housing, through the seal assembly, and up the tubing string to the surface of the ground.

4,511,000

BITUMEN PRODUCTION AND SUBSTRATE STIMULATION

Donald S. Mims, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Feb. 25, 1983, Ser. No. 469,678
Int. Cl.³ E21B *36/00, 43/12, 43/24*
U.S. Cl. 166—303 **8 Claims**

1. Well completion in a substrate for producing viscous hydrocarbon by thermal stimulation of the substrate in which said hydrocarbon is retained, with a hot stimulating fluid, which completion includes;

an elongated well liner which is disposed in a first well bore formed in the substrate, at least a portion of said elongated well liner being perforated and extending in a substantially horizontal disposition through said layer, and having a well head at the liner production end,

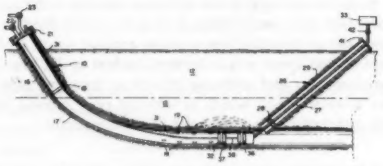
at least one secondary well formed in the substrate and terminating in a region adjacent to a portion of the first well bore,

a diverter means movably positioned within said well liner and being operable between expanded and contracted modes, and said diverter means having a peripheral edge disposed contiguous with the inner wall of said liner and being adapted when in the expanded mode to contact said liner inner wall to prevent flow of fluid therethrough,

a substrate stimulating system including a conduit disposed in said at least one secondary well and adapted at one end to communicate with a hot, pressurized source of said hot stimulating fluid, said conduit other end opening in a region of the first well bore, whereby to direct a pressurized flow of the hot stimulating fluid into the vicinity of the elongated well liner and into the liner remote end,

diverter positioning means communicated with said diverter means, and being operable to longitudinally adjust the location of said diverter means along the well liner in a direction toward the well head,

said diverter means including longitudinally spaced apart terminal pieces which are communicated with said diverter positioning means, each terminal piece being operable between contracted and expanded positions whereby each of said terminal pieces is independently operable for progressively lengthening the spacing between the respective terminal pieces.



3. Method for producing viscous hydrocarbons by thermal stimulation of a substrate layer which holds said hydrocarbons, which method includes the steps of;

providing a first well bore, which extends from the surface, into the substrate layer, being disposed in a substantially horizontal disposition through the latter, and having a perforated liner which extends substantially the length of said well bore between the surface, and the well remote end,

forming a second well bore through the substrate in a direction to establish communication with the remote end of said first well,

providing a stimulating fluid diverter member within said perforated liner, having opposed diverter end pieces which are independently operable within said liner to divide said liner into adjustable length injection segments, and production segments, and

introducing a flow of hot, pressurized stimulating fluid into said liner injection segment, whereby said hot fluid will contact one of said diverter member end pieces and be directed from the perforated liner, outwardly into the substrate thereby to heat the latter and to enhance production of an aqueous hydrocarbon mixture therefrom by establishing a flow path pattern for said hydrocarbon mixture through the substrate and which pattern terminates intermediate the other of said diverter end piece in said liner producing end.

4,511,001
COMPOSITION AND METHOD FOR CORROSION INHIBITION

Yulin Wu, c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Division of Ser. No. 298,445, Sep. 1, 1981, Pat. No. 4,460,482. This application Feb. 13, 1984, Ser. No. 579,333
Int. Cl.³ C21F *11/14*; E21B *41/02*
U.S. Cl. 166—310 **20 Claims**

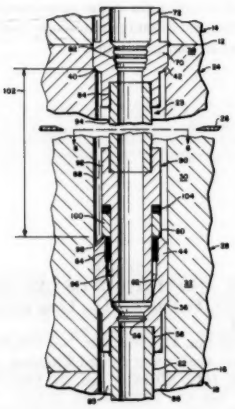
1. A method for treating a metal surface to inhibit corrosion thereof, comprising contacting the metal surface with a composition which is the product of introducing carbon dioxide under greater than atmospheric pressure into a vessel containing an amine in a diluent selected from the group consisting of liquid hydrocarbons, alcohols and mixtures of these, and maintaining the resulting carbon dioxide-containing composition at greater than atmospheric pressure for a finite period of time prior to contacting the metal surface to be treated with the thus prepared composition.

16. A method for treating metal surface of equipment in a well for the recovery of natural fluids from a subterranean reservoir, the method comprising injecting a composition comprising (a) a primary or secondary amine, (b) a diluent selected from the group consisting of liquid hydrocarbons, alcohols and mixtures of these, and (c) carbon dioxide into the well and allowing the composition to contact the metal surfaces for a time sufficient to form a corrosion-inhibiting film thereon.

4,511,002
MULTIPLE TUBING HANGER TIE BACK SYSTEM AND METHOD

Frank C. Adamek, Pasadena; James V. Bonds, and Charles D. Bridges, both of Houston, all of Tex., assignors to Gray Tool Company, Houston, Tex.

Filed Oct. 21, 1983, Ser. No. 544,143
Int. Cl.³ E21B *33/04, 29/00*
U.S. Cl. 166—382 **13 Claims**



8. An oil well tubing head system for installation between a rigidly supported wellhead (18) and a Xmas tree (14), comprising:

a system housing (10) including an upper tubing head (24) connected to the Xmas tree (14), a lower tubing head (28) connected to the wellhead (18) and a tubing shear ram (26) connected between the upper and lower tubing heads, the interior of said housing including a stack (30) containing a generally cylindrical vertical passageway (25) therethrough;

a lower tubing hanger (44) supported within the lower tubing head (28) for carrying a tubing string (22), said lower hanger including a control shoulder (60) at its upper end and a tapered interior surface (62);

an upper tubing hanger (70) supported within the upper tubing head (24);

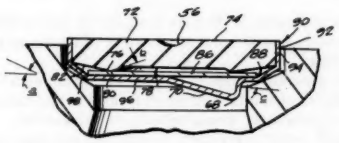
a tie back subassembly (90) connecting said upper and lower tubing hangers, including a tubing section (94) passing through the bore of the shear ram (26), and being secured to the lower end of the upper tubing hanger, and further including a spacer member (92) secured to the lower end of the tubing section, said spacer member including a downwardly projecting inner stab nipple (96) in interference engagement with said tapered inner surface (62) and a downwardly facing, outer load transfer surface (98) abutting said control shoulder (60);

whereby upon actuation of the shear ram (26), the tubing section (94) is severed without downward movement of the tubing string (22).

4,511,003
SPRINKLER

Lowell N. Randall, 249 S. Miranda, Las Cruces, N. Mex. 88005

Filed Jul. 29, 1983, Ser. No. 518,759
Int. Cl.³ A62C *37/10*
U.S. Cl. 169—38 **15 Claims**



1. A sprinkler, comprising:

a body having a bore with an inlet and an outlet;

surface means circumferentially providing an annular valve seat in said bore of said body;

a disk-like valve member constructed and arranged to be normally held in resilient, circumferential sealing engagement with said valve seat;

a heat-failing compression strut having two opposite ends;

bail means provided on said body for retaining said compression strut in compression against the valve member in a sense to urge the valve member into circumferential sealing engagement with said valve seat, with the compression strut having one end bearing against the bail and the other end bearing against the valve member;

means acting between said strut and said body for adjusting the amount of sealing force applied by the strut to the valve member;

said disk-like valve member including a disk-like stiffly resilient wafer having a central region, an annular radialiy intermediate region, and an outer peripheral margin with an outer edge, said wafer having an inner side facing upstream and an outer side facing externally;

said wafer outer peripheral margin being arranged to circumferentialy, resiliently, sealingly bear against said valve seat;

said wafer central region being arranged to face upstream pressure such that increasing pressure on the wafer central region tends to resiliently dome said wafer;

fulcrum means arranged to annularly bear against said wafer radially intermediate region, against the outer side of said wafer, so that as increasing upstream pressure tends to dome said wafer central region, said wafer outer peripheral margin tends to pivot about said fulcrum means for increasing the force and area of sealing contact between the valve member and the valve seat; and

stop means constructed and arranged to limit axial move-

ment of the fulcrum means in the upstream direction to a predetermined amount and thus prevent application of excessive force to the peripheral margin of the wafer.

4,511,004

APPARATUS FOR DRILLING A PLURALITY OF BORES IN A LAWN

Michael Deneen, 4112 W. Driftwood Dr., Holiday, Fla. 33590

Filed Apr. 28, 1983, Ser. No. 489,511
Int. Cl.³ A01B *45/02*
U.S. Cl. 172—21 **8 Claims**

1. An apparatus of the type designed to drill a plurality of equidistantly spaced bores in a lawn or other support surface, comprising,

a flat, generally planar in configuration base member,

a plurality of aperture members formed in said base member in equidistantly spaced relation to one another,

a handle member pivotally mounted to said base member,

a plurality of wheel members rotatably mounted to said base member and adapted to transport said base member relative to a support surface,

a linkage means adapted to lower or raise said base member relative to a support surface when said handle member is in a first or second position, respectively,

said linkage means including a pair of linkage members mounted in transversely spaced, substantially parallel relation to one another on opposite sides of said base member,

each of said linkage members including an elongate interconnecting rod having its proximal end pivotally connected to said handle member,

each of said linkage members including a pair of longitudinally spaced offset members,

each of said offset members having an elongate major body portion and a truncate offset portion disposed substantially normal to and rearward of said major body portion at a first end thereof,

said respective offset portions pivotally connected to an associated one of said interconnecting rods

an axle member formed at a second end of said major body portion of said respective offset members rotatably mounting one of said wheel members to said base member,

and said respective major body portions of said offset members being pivotally connected to said base member so that rearward pivoting of said handle member effects raising of said base member and forward pivoting thereof effects lowering of said base member.

4,511,005

CENTERLINE SIGHT WITH REVERSE PENDULUM

Sam J. Brown, Cozad, Nebr., assignor to Sam J. Brown Land & Cattle Company, Inc., Cozad, Nebr.

Filed Nov. 7, 1983, Ser. No. 548,993
Int. Cl.³ A01B *69/00*
U.S. Cl. 172—430 **7 Claims**

1. A row follower guidance apparatus for a tractor having front and rear ends and a forwardly facing operator seat thereon, said apparatus comprising,

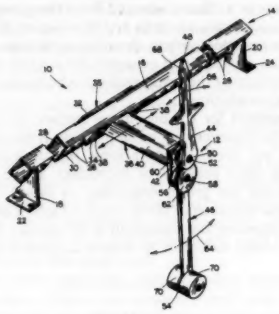
a sighting device,

mounting means for supporting said sighting device on the tractor forwardly of the operator seat, said mounting means providing for adjustment of said sighting device transversely of the tractor,

lock means for securing said sighting device in a selected transverse position along said mounting means,

said sighting device including,

a base,



an upstanding sight having an upper end and a lower end pivotally connected to the base for transverse pivotal movement of the upper end thereof,

a pendulum having a lower end and an upper end pivotally connected to the base for transverse pivotal movement of the lower end thereof, and

coacting drive means on said sight and pendulum, said coacting drive means being operative to move the upper end of said sight in the same transverse direction as the lower end of said pendulum in response to pivotal movement of said pendulum.

4,511,006

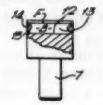
DRILL BIT AND METHOD OF USE THEREOF

Alfred J. Grainger, 66 Oxstalls La., Long Leven, Gloucestershire, England

Filed Jan. 17, 1983, Ser. No. 458,503
Claims priority, application United Kingdom, Jan. 20, 1982, 8201609; Jan. 20, 1982, 8201610; Jan. 20, 1982, 8201611
Int. Cl.³ E21B *10/50, 10/56*
U.S. Cl. 175—57 **12 Claims**

1. A method of making a small diameter hole in a substrate such as the face of a mine, the method comprising (1) advancing to the mine face a rotary drill having a drill bit of a diameter of from about 50 mm to about 100 mm, the bit having a body including at least one socket, one end of a shank being received in the socket, a cutting element being held in a holder at the free end of the shank, the shank being free to rotate and thereby rotate the cutting element to form a small diameter hole in the substrate, the cutting element comprising a backing part and a facing part, the backing part being received and held by mechanical pressure of the shank, the facing part comprising an agglomerate of natural or synthetic diamond which

provides the cutting edge, and (2) rotating the drill bit at a speed of from about 200 to 600 rpm, with the cutting element



being caused or allowed to rotate to cut into the substrate and so drill the hole.

4,511,007

LOCKING DEVICE FOR A TOOL WITH TELESCOPICALLY DISPLACEABLE PARTS

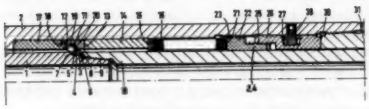
Thomas Jung, Isernhagen, and Gerhard Heidemann, Celle, both of Fed. Rep. of Germany, assignors to Norton Christensen, Inc., Salt Lake City, Utah

Filed Aug. 10, 1983, Ser. No. 521,877

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3234003

Int. Cl.³ E21B *4/14*

U.S. Cl. 175—297 **15 Claims**



1. A locking device for a telescopic tool comprising:

relatively telescopically displaceable spindle and sleeve portions including an annular chamber in which the locking device is disposed between the spindle and sleeve portions;

rollable locking elements adapted for radial displacement in the annular chamber and situated adjacent an abutment supported by one of the spindle and sleeve portions opposing and preventing axial displacement of the rollable locking elements during radial displacement thereof and unlocking of the tool;

an axially displaceable counter element with a beveled surface thereon situated on one side of the locking elements, engageable and displaceable relative to one of the spindle and sleever portions by radial displacement and engagement of the locking elements with the beveled surface;

spring means of predetermined force opposing and biasing the axially displaceable counter element and bevel surface thereon toward one side of the locking elements; and

another rigid counter element with a beveled surface of sufficient rigidity to resist radial stress, carried by the other one of the spindle and sleeve portions on an opposite side of the locking elements and adapted upon the application of sufficient axial force between the spindle and sleeve portions to radially displace the locking elements against the bevel surface of and displace the axially displaceable counter element against and compress the spring means a sufficient axial distance whereby the bevel surface on and moving axially with the axially displaceable counter element allows the locking elements to move radially away from and the rigid counter element to pass by and selectively place the telescopic spindle and sleeve portions of the tool in a locked or unlocked state.

4,511,008

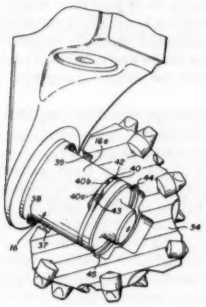
ROTARY CUTTER DRILL BIT WITH PERMANENT SNAP RING CUTTER RETENTION

David T. Brunson, Arlington, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 6, 1984, Ser. No. 568,979

Int. Cl.³ E21B *10/08*

U.S. Cl. 175—369 **8 Claims**



1. In an earth boring apparatus including an earth engaging cutter rotatably mounted on a journal, said cutter having an internal annular surface in opposed axial alignment with an annular surface of said journal, an improved cutter retention means disposed therebetween and cooperating with said opposed annular surfaces to retain said cutter on said journal, and wherein said improved cutter retention means comprises:

a first groove in said internal annular surface of said cutter, said first groove having a first axial width;

a second groove in said annular surface of said journal, said second groove having one portion defining a like first axial width in axial alignment with said first groove and the remainder thereof having an enlarged axial width;

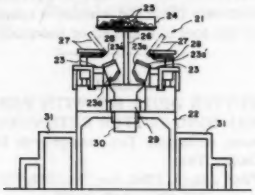
a resilient split ring of generally said first axial width and having a circumference when the ends of said ring abut, greater than the circumference of said annular surface of said journal, and wherein the radial depth of said ring is greater than the radial dimension of said first groove and not greater than the radial dimension of said second groove;

whereby during assembly of said cutter on said journal, said ring is disposed within said second groove and compressed to be generally coextensive with the surface of said journal by the ends of said ring being axially overlapped in said axially enlarged remainder of said second groove, whereupon said ring, upon axial alignment of said first groove with said one portion of said second groove, snaps into said first groove radially extending between the opposed first and second grooves and prevented from again assuming a compressed condition coextensive with said journal so that the cutter is permanently retained on said journal.

4,511,009
COMBINATORIAL WEIGHING APPARATUS AND METHOD

Koichi Kataoka, Shiga, Japan, assignor to Kabushika Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Sep. 30, 1983, Ser. No. 537,570
Claims priority, application Japan, Jan. 10, 1982, 57-149852[U]
Int. Cl.³ G01G *19/00, 19/22*
U.S. Cl. 177—1 **8 Claims**



1. A combinatorial weighing apparatus having a plurality of weighing machines each provided with a weighing hopper, wherein the weighing hoppers are supplied with articles, combinations are computed based on weight values provided by the weighing machines, and a selected combination of articles is discharged from the weighing hoppers, said apparatus comprising:

weighing hoppers provided for respective ones of the plural weighing machines, said weighing hoppers being arranged in at least a single row;

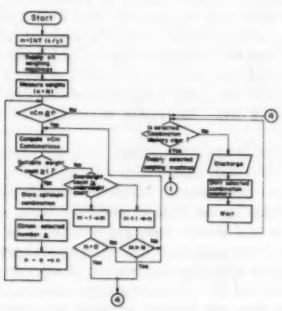
a plurality of tiltable pool trays located diagonally above corresponding ones of said weighing hoppers and provided at a height at which each can be viewed from outside the apparatus, said pool trays temporarily retaining a batch of received articles, wherein, after articles are discharged from selected weighing hoppers, the pool trays corresponding thereto are tilted to automatically resupply these weighing hoppers; and

a collecting conveyor for collecting articles discharged from the selected weighing hoppers.

4,511,010
COMBINATORIAL WEIGHING METHOD AND APPARATUS THEREFOR

Takashi Sashiki, Nagaokakyo, and Keiko Sakaeda, Kyoto, both of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Sep. 12, 1983, Ser. No. 531,401
Claims priority, application Japan, Sep. 11, 1982, 57-158347
Int. Cl.³ G01G *19/04, 19/00*
U.S. Cl. 177—25 **9 Claims**



1. A combinatorial weighing method in which weight data from a plurality of weighing machines containing articles, are combined to obtain an optimum combination of weighing machines giving a total combined weight value of articles equal to a target value or closest to the target value within preset allowable limits, and in which the articles are discharged from the obtained optimum combination of weighing machines, comprising the steps of:

(a) predicting and entering a limit value p, p being an integer greater than or equal to one, for a number of combinations giving at least one total combined weight value within the preset allowable limits;

(b) comparing a number ${}_nC_m$ of combinations and the limit value p, where n, being an integer greater than or equal to one, represents a number of weighing machines that have been supplied with articles, and ${}_nC_m$ represents a number of combinations that select m weighing machines, m being an integer greater than or equal to one, from the n weighing machines;

(c) obtaining, when ${}_nC_m > p$ holds, an optimum combination of weighing machines giving a total combined weight value of articles equal to a target value or closest to the target value within the preset allowable limits, the optimum combination being obtained from among the combinations that select the m weighing machines from the n weighing machines;

(d) discharging the articles from the obtained optimum combination of weighing machines;

(e) performing the following operation:

$$n-a\rightarrow n$$

where a is an integer greater than or equal to one and represents a number of weighing machines selected as the optimum combination, and repeating said steps from step (b) onward without resupplying weighing machines with articles;

(f) when ${}_nC_m < p$ holds, supplying articles afresh to the weighing machines that have discharged their articles, and repeating said steps from step (b) onward.

7. A combinatorial weighing apparatus in which weight data from a plurality of weighing machines containing articles are combined to obtain an optimum combination of weighing machines giving a total combined weight value of articles equal to a target value or closest to the target value within preset allowable limits, and in which the articles are discharged from the obtained optimum combination of weighing machines, comprising:

limit value setting means for predicting and entering a limit p, p being an integer greater than or equal to one, of a number of combinations giving at least one total combined weight value within the preset allowable limits;

comparison means, operatively connected to said limit value setting means, for comparing a number ${}_nC_m$ of combinations and the limit value p, wherein n is an integer greater than or equal to one and represents a number of weighing machines that have been supplied with articles, and ${}_nC_m$ is an integer greater than or equal to one which represents a number of combinations that selects m weighing machines, m being an integer greater than or equal to one, from the n weighing machines;

combinatorial computing means, operatively connected to said weighing machines, for obtaining, when ${}_nC_m > p$ holds, an optimum combination of weighing machines giving the total combined weight value equal to the target value or closest to the target value within preset allowable limits, said optimum combination of weighing machines being obtained from among the combinations that select the m weighing machines from the n weighing machines;

means for discharging the articles from the obtained optimum combination of weighing machines;

means, operatively connected to said combinatorial computing means, for performing the following operation:

$$n-a\rightarrow n$$

wherein a is an integer greater than or equal to one and represents a number of weighing machines selected as the optimum combination, and for repeating the foregoing combinatorial weighing operation without resupplying the weighing machines with articles; and

means, operatively connected to the weighing machines, for supplying articles afresh to the weighing machines that have discharged their articles, and for repeating the foregoing combinatorial weighing operation, when ${}_nC_m < p$ holds.

4,511,011

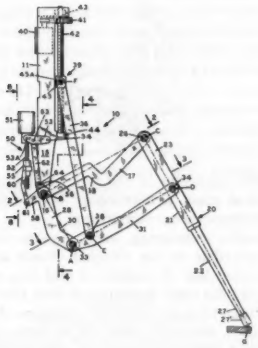
LEG MECHANISM FOR WALKING MACHINE

Stephen J. Bartholet, Orange, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Mar. 18, 1983, Ser. No. 476,558

Int. Cl.³ B62D *57/02*

U.S. Cl. 180—8.6 **6 Claims**



1. A leg mechanism for a walking machine comprising:

a frame member;

a first elongate link, a first end of said first link being pivotally connected to said frame member;

a pair of second elongate links, first ends of said links being pivotally connected to a second end of said first link, on opposite sides thereof, to permit positioning of said first link between said second links, second ends of said second links being interconnected to form a foot;

a pair of third elongate links, first ends of said third links being pivotally conntected to said frame member and said first end of said first link, with said first link between said third links; and

a pair of fourth elongate links, first ends of said fourth links being pivotally connected to second ends of said third links with said third links between said fourth links, second ends of said fourth links being pivotally connected to an intermediate point on said second links, with said second links between said fourth links, to permit positioning of said second links between said fourth links.

4,511,012

DRIVE AXLE FOR A MOTOR VEHICLE

Josef Rauneker, Ostfildern-Ruit, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,816

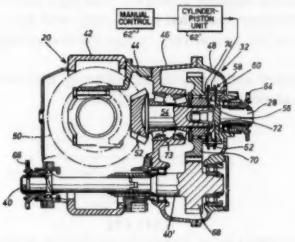
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211621

Int. Cl.³ B62D *25/00*

U.S. Cl. 180—65.2 **22 Claims**

1. A drive axle system for a motor vehicle, wherein a drive axle can be driven by a drive unit comprising one of an internal combustion engine and an electric motor, and to which axle a gear unit is assigned, this gear unit possessing gear unit input shafts which can be driven by one of the drive units in each case, a gear unit output shaft which is coupled to the drive axle, as well as a shifting clutch for coupling the gear unit output shaft to one of the gear unit input shafts, the shifting clutch interacting with tooth systems which function as driving devices, the gear unit shafts being installed axially parallel to one another and at right angles to the lengthwise direction of the axle beam of the drive axle, characterized in that

the gear unit is a changeover gear unit which is installed on the axle beam of the drive axle, and which serves for alternative selection of one of the drive units, internal combustion engine and electric motor, in that



the drive ends of the gear unit input shafts, which are mounted, spaced apart, one above the other, are led out of the changeover gear unit on opposite sides, and in that

one of the gear unit input shafts is mounted beneath the gear unit output shaft and carries a spur pinion which is installed in a manner preventing rotation with respect to said one input shaft and which meshes with a spur pinion which is installed on the gear unit output shaft, it being possible to couple the latter spur pinion to the gear unit output shaft by means of the shifting clutch, while simultaneously decoupling the other gear unit input shaft from the gear unit output shaft.

4,511,013

REAR SUSPENSION SYSTEM FOR MOTORCYCLES

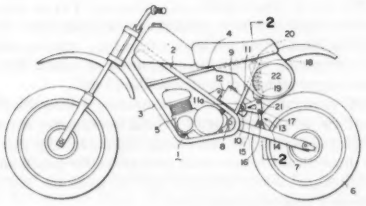
Shinichi Miyakoshi, and Kazuhiko Tsunoda, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1982, Ser. No. 400,935

Claims priority, application Japan, Jul. 23, 1981, 56-109981[U]

Int. Cl.³ B62K *25/20*

U.S. Cl. 180—227 **11 Claims**



1. In a motorcycle having a relatively stationary rigid structure, a rear wheel and a pivotable element which is pivotable with respect to said rigid structure together with vertical movement of said rear wheel, a rear wheel suspension system comprising:

a pivotable-shaft actuated type damper fixedly mounted on

said rigid structure in stationary relation thereto, said damper being provided with actuating means therefor;

said damper actuating means comprising a pivotable operating shaft, said damper operatively cooperating with said pivotable operating shaft so as to generate a damping force, while remaining stationary relative to said rigid structure, upon pivotal movement of said operating shaft about its own axis;

a link mechanism operatively connected between said pivotable element and said damper, said link mechanism comprising a rod connected with a pivotable link member;

said operating shaft of said damper being integrally connected with said link member so as to define a pivot shaft for said link member which pivots integrally therewith;

a coil spring tensioned between said rigid structure and said link member such that said spring, said link member and said rod are operatively connected and arranged in series; and

said damper and said coil spring being mounted separately and independently of each other.

4,511,014

SYSTEM FOR CONTROLLING A POWER TRANSMISSION OF A FOUR-WHEEL DRIVE VEHICLE

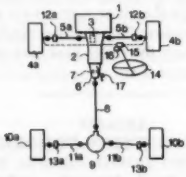
Fujio Makita, Hachioji, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1982, Ser. No. 395,188

Claims priority, application Japan, Jul. 7, 1981, 56-106648

Int. Cl.³ B60Q *1/00*; B60K *31/00*

U.S. Cl. 180—233 **8 Claims**



1. A system for controlling a power transmission of a four-wheel drive vehicle powered by an engine comprising:

the transmission being arranged for transmitting a power of said engine to two main driving wheels;

a clutch for selectively transmitting said power to two wheels other than said two main driving wheels;

speed sensors for producing output signals dependent on speeds of the four wheels;

a steering-angle sensor for producing an output signal dependent on the steering-angle;

a first computing circuit for computing an actual slip rate from output signals of said speed sensors;

a second computing circuit for computing a theoretical slip rate from said output signal of said steering-angle sensor;

a comparing circuit for comparing the actual slip rate and the theoretical slip rate with each other for producing an output signal when the difference between the slip rates exceeds a predetermined level;

a first circuit means responsive to said output signal of said comparing circuit to produce an output signal for a predetermined time; and

a second circuit means responsive to said output signal of said first circuit means for operating said clutch for the engagement thereof. whereby four-wheel driving power transmission is established.

4,511,015

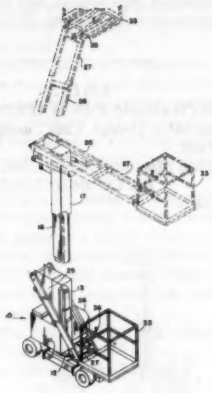
MANLIFT

Paul J. Purdy, 608 Morningside Dr., Trenton, Mo. 64683

Filed Jun. 15, 1983, Ser. No. 504,429

Int. Cl.³ B66F *11/04*

U.S. Cl. 182—2 **4 Claims**



1. In a manlift apparatus of the type including a wheeled chassis, a vertical mast, a telescoping boom, and an aerial platform, the improvements comprising:

a fully hydraulic, telescoping, vertical mast, mounted on a rotating base plate on the wheeled chassis slightly offset from the center line of rotation of said base plate;

said fully hydraulic mast including at least two telescoping sections driven to reciprocate by a package of plural equal area cylinders, integrally attached to each other and attached to said telescoping sections, said package of cylinders located within the innermost telescoping section so as to be removable therefrom without disassembly of said telescoping sections; and

a telescoping boom mounted to one side of the uppermost section of the vertical mast and extending beyond the other side of said mast in a straddling manner to the aerial platform, said telescoping boom being operated by cylinders located substantially on the said one side of said vertical mast opposite from the aerial platform.

4,511,016

LUBRICATING SYSTEM FOR GAS TURBINE ENGINES

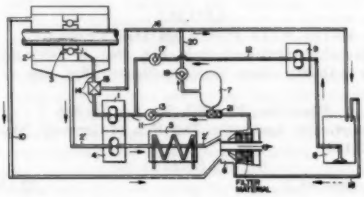
Hermann Döell, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 7, 1983, Ser. No. 549,413

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242366

Int. Cl.³ F16N *29/02*; F01M *11/12*

U.S. Cl. 184—6.11 **8 Claims**



1. A lubricating system for gas turbine engines, comprising a

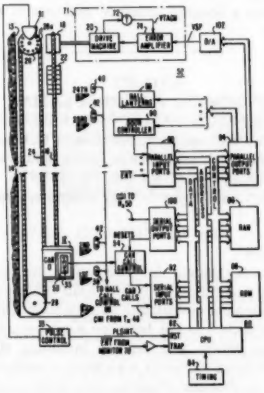
lubricant circulating circuit including lubricating chamber means (2), lubricant pressure pump means (1) and a main supply conduit means (14) operatively connecting said pressure pump means to a pressure input of said lubricating chamber means for lubricating an engine component in said lubricating chamber means, suction pump means (4) operatively connected to a suction output of said lubricating chamber means (2), lubricant air separator means (6) vented to the atmosphere, conduit means (2') operatively connecting said lubricant air separator means (6) to said suction pump means (4), return conduit means (11) operatively connecting said lubricant air separator means (6) back to said pressure pump means (1), and lubricant storage accumulator means (7) operatively connected to said return conduit means (11), said system comprising a further pressure pump means (9), lubricant supply container means (8), and auxiliary conduit means (12) operatively connecting said further pressure pump means (9) to said main supply conduit means (14) of said lubricant circulating circuit for replenishing lubricant from said supply container means (8) only during engine starting and during engine operation under normal flight conditions, said main supply conduit means (14) comprising first valve means (15), said return conduit means (11) comprising second valve means (13, 21), and said auxiliary conduit means (12) comprising third valve means (17), said first, second and third valve means being responsive to variable oil pressures occurring in said respective conduit means for assuring a lubrication in said lubricating chamber means (2) independently of gravity, especially zero gravity, influences under critical flight conditions.

4,511,017

ELEVATOR SYSTEM

Robert C. MacDonald, West Caldwell, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 20, 1983, Ser. No. 534,005
Int. Cl.³ B66B *5/02*
U.S. Cl. 187—29 R **21 Claims**



1. A method of providing emergency elevator service for each floor of a building having a bank of elevator cars and a plurality of floors, including a main floor, comprising the steps of:

pre-assigning a predetermined different pattern of floors to each elevator car of the bank,

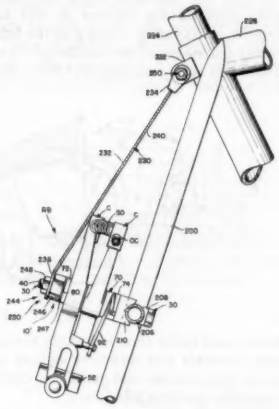
and revising the assignment for each car after a predetermined occurrence.

4,511,018

BICYCLE BRAKE MECHANISM

Edward Scott, S. Hwy. 75, P.O. Box 323, Ketchum, Id. 83340

Filed Feb. 11, 1982, Ser. No. 347,953
Int. Cl.³ B62L *1/12*
U.S. Cl. 188—24.12 **6 Claims**



1. An improvement in a bicycle brake of the type having a caliper means, a mounting bolt attaching the caliper means to a bicycle frame, the improvement comprising:

an adaptor means abutting the bicycle frame and having a bore defined therethrough through which the mounting bolt extends; and

a mounting post having a trunk section and a head section, said head section abutting said adaptor means and being larger in cross-sectional area than said trunk section, said trunk section and said head section having a bore defined therethrough through which the mounting bolt extends, sdid trunk section having caliper mounting means thereon for attaching the caliper means to said mounting post and mounting bolt attaching means for attaching said mounting post to the mounting bolt, further including means attaching said mounting post to seat stays of the bicycle, together with adjustable means for bracing said mounting post including a brace rod attaching the trunk section of said mounting post to a seat post of the bicycle.

4,511,019

SPOT-TYPE DISC BRAKE, IN PARTICULAR FOR AUTOMOTIVE VEHICLES

Vlad Marianu, Frankfurt-Griesheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 6, 1982, Ser. No. 446,849
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1982, 3209389
Int. Cl.³ F16D *55/224, 65/00*
U.S. Cl. 188—72.2 **9 Claims**

1. A spot-type disc brake for use in conjunction with a brake disc mounted on a support for rotation at least in one direction about an axis, comprising:

a support member stationarily mounted on the support;

first and second brake shoes respectively mounted on said support member at one and the other axial side of the brake disc for movement toward and away from the brake disc; and

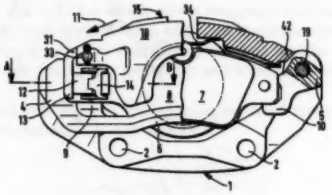
means for moving said brake shoes at least toward the brake disc, including a caliper member,

means for mounting said caliper member on said support member for movement relative thereto so that said caliper member extends past the brake disc and said brake shoes,

including a first guide element mounted on one of said members for movement relative thereto substantially parallel to the axis of the brake disc, and

a second guide element mounted on the other of said members and rigidly connected to said first guide element so as to permit said caliper member to conduct movement relative to said support member substantially in and opposite to said one direction while preventing said caliper member from turning relative to said support member about an axis extending radially of the brake disc,

an actuating unit mounted on said caliper member at said one axial side and acting on said first brake shoe directly and



on said second brake shoe indirectly through said caliper member, wherein said members include respective guiding bores; and wherein said guide pins slidably received in the respective guiding bores, and

wherein said guiding bores are centered on bore axes one of which is parallel to, and more remote from the axis of the brake disc than the other in the mounted condition of the disc brake; wherein said guide pins are coaxially received in said guiding bores for turning about said bore axes; and wherein said mounting means further includes a lever rigidly interconnecting said guide pins and keeping the same a predetermined distance apart.

4,511,020

DISC BRAKES

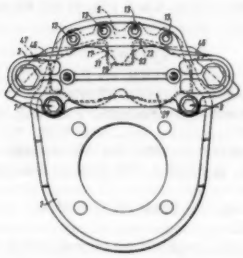
Francis V. Williams, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jul. 26, 1982, Ser. No. 401,557

Claims priority, application United Kingdom, Aug. 4, 1981, 8123757

Int. Cl.³ F16D *65/02*

U.S. Cl. 188—73.39 **11 Claims**



1. A pin sliding caliper disc brake, comprising a caliper and a first torque taking member, said caliper and first torque taking member being slidable relative to each other by means of a sliding connection, the caliper being open-topped for the insertion of friction pad assemblies, and a supplementary torque taking member detachably secured to said first torque taking member, said supplementary torque taking member having a pair of projections each of which, in use, engages a friction pad assembly at a position where said projection takes all of the braking forces exerted on said friction pad assembly while relieving said caliper of braking forces, said pair of projections being in the form of shaped fingers which project generally radially of the brake disc, one on either side thereto, and engage in recesses in the friction pad assemblies.

4,511,021

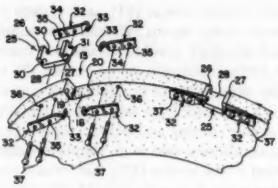
BRAKE APPARATUS

Bruce A. Grider, Troy, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 21, 1983, Ser. No. 487,344

Int. Cl.³ F16D *65/02*

U.S. Cl. 188—218 XL **12 Claims**



6. In a friction brake disc having a pair of annular flat wall surfaces, an inner peripheral wall surface, and an outer peripheral wall surface, said disc having a plurality of circumferentially spaced slots along one of said periphery wall surfaces for engagement by a spline of a torque device; each of said slots having two generally radially extending walls and a bottom surface extending between and interconnecting said walls; an insert located within each of said slots for reinforcing said slots; each of said inserts having a general U-shaped configuration with two spaced end sections and an interconnecting bridging section; each of said end sections having a pair of spaced side edges and an outer edge; said outer edge terminating at said one peripheral wall surface; all of said side edges of said inserts being recessed; a clip secured to said disc adjacent to each of said recesses; each of said clips having a curved projection extending into an adjacent recess of said inserts to retain said insert within said slots; there being four clips for each of said inserts; and there being a clearance space between said curved projections of said clips and said recesses of said inserts to provide a floating action of said inserts within their respective slots.

4,511,022

VALVE ARRANGEMENT FOR REGULATING VEHICLE SUSPENSION DAMPING PRESSURES

Alan Thomas, Stratford on Avon, and Stanley G. Glaze, Brierley Hill, both of England, assignors to Lucas Industries, England

Filed Jan. 13, 1983, Ser. No. 457,576

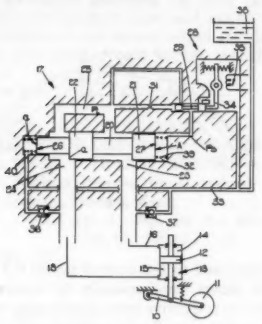
Claims priority, application United Kingdom, Jan. 20, 1982, 8201550

Int. Cl.³ F16F *9/20*

U.S. Cl. 188—299 **7 Claims**

1. A valve arrangement for regulating the pressures on opposite sides of a damping piston in a road vehicle suspension, said valve arrangement comprising two identical valve devices in series and connected, in use, between zones on opposite sides of said damping piston, said devices including substantially identical flow control elements which are coupled for movement in unison so that the effective flow areas of the devices are substantially equal to each other in all operating positions of their flow control elements and the fluid pressure intermediate the devices is substantially equal to the arithmetic mean of said pressures on opposite sides of the damping piston, a further valve for regulating a servo pressure in accordance with the magnitude of said intermediate pressure and the magnitude of an electrical input signal, and means for positioning said flow control elements in response to said servo pressure so that, for a given value of said input signal a change in said

intermediate pressure causes said servo pressure to move said control elements in a sense to oppose said change, whereby



said intermediate pressure, and hence the force acting on said damping piston, is dependent on the magnitude of said electrical input signal.

4,511,023

CLUTCH BRAKE APPARATUS FOR FARM WORK MACHINERY OR OTHER APPARATUS

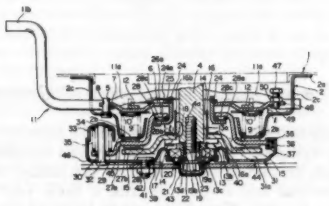
Shigeo Nagai, Nagano, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Japan

Filed Apr. 16, 1981, Ser. No. 254,591

Claims priority, application Japan, Apr. 28, 1980, 55-56827; Apr. 28, 1980, 55-56828; Apr. 28, 1980, 55-56829; Apr. 28, 1980, 55-58750[U]; Apr. 30, 1980, 55-57668; Apr. 30, 1980, 55-59592[U]; Apr. 30, 1980, 55-59593[U]; Apr. 30, 1980, 55-59594[U]; Apr. 30, 1980, 55-59595[U]; Apr. 30, 1980, 55-59596[U]; Apr. 30, 1980, 55-59597[U]; Sep. 24, 1980, 55-135609[U]; Sep. 26, 1980, 55-136863[U]; Sep. 26, 1980, 55-136864[U]; Sep. 26, 1980, 55-136865[U]; Sep. 30, 1980, 55-139471[U]; Sep. 30, 1980, 55-139472[U]; Sep. 30, 1980, 55-139473[U]

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—18 R **27 Claims**



1. A clutch brake apparatus, comprising:

a fixed member secured to an engine mounting;

an engine output shaft projecting from the fixed member;

a rotating member rotatably mounted on the output shaft;

a pressure plate mounted on said fixed member and movable in a direction parallel to the output shaft;

a pressure spring between the pressure plate and the fixed member;

an operation rod adjacent said pressure plate, upon which said pressure plate is urged by said pressure spring, for moving said pressure plate against the force of said pressure spring;

a disc plate integrally rotatable with said output shaft, opposite said fixed member with respect to said pressure plate;

a clutch plate between the disc plate and the fixed member, having inner and outer peripheries, movable in the direction parallel to the output shaft, rotatable with said rotating member;

means for urging said clutch plate toward said fixed member;

a clutch spring for urging the clutch plate toward the disc plate; and

means for engaging the inner periphery of said clutch plate with said pressure plate while allowing relative rotation therebetween, so that, when said pressure plate is moved against the force of said pressure spring by said operation rod, said clutch plate is separated from said fixed member and is urged upon said disc plate by said clutch spring.

4,511,024

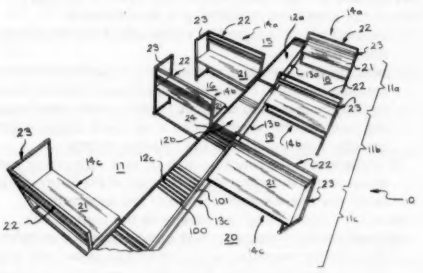
MODULAR UNIT WITH FOLDABLE PANELS

Dennis L. Long, 2524 Santigo SE., Grand Rapids, Mich. 49506

Filed Jul. 29, 1983, Ser. No. 518,480

Int. Cl.³ B65G *47/00*

U.S. Cl. 198—346 **14 Claims**



1. A portable and unfoldable modular unit (**11**) including a combined conveyor and work station (**15**, **16**, **17**, **18**, **19**, **20**) which comprises:

(a) a conveyor including a frame (**13**) supporting a conveyor surface (**12**) between opposite ends (**24**) of the frame at a pre-selected height of the frame;

(b) a vertically oriented first panel (**22**) mounted on the frame by first hinge means (**201**) so as to be unfoldable on a vertical axis into an open position at a 90° angle away from the conveyor surface and so as to be foldable on the vertical axis into a position parallel to a line (**2—2**) between the ends of the conveyor surface;

(c) a vertically oriented second panel (**23**) mounted on the first panel by second hinge means (**200**) so as to be in an open position at a 90° angle from the first panel and parallel to the line between the ends of the conveyor surface and so as to be foldable into a position parallel to the line between the ends of the conveyor surface;

(d) a work surface (**21**) hinged on the first panel by first retaining means (**202**) such that when the work surface is folded the surface is parallel to the first panel and when in an open position is at approximately a 60° to 90° angle to the first panel; and

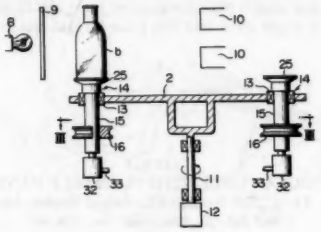
(e) second retaining means (**204**) mounted on the work surface which detachably connect to the frame and second panel to hold the work surface in the open position, wherein when the work surface is folded the first and second panels can be folded to be positioned parallel with the line between the ends of the conveyor surface in order to provide the unit in a folded portable configuration.

4,511,025

ARTICLE HOLDING APPARATUS OF ROTARY TYPE

Toshikazu Nakayama, Yokohama, Japan, assignor to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1982, Ser. No. 432,269
Claims priority, application Japan, Oct. 6, 1981, 56-148655[U]
Int. Cl.³ B65G 29/00
U.S. Cl. 198—377 9 Claims



1. An apparatus for firmly holding bottle like containers to rotate about a center axis of each of a plurality of supporting mechanisms at high speed while they revolve around a center axis of the apparatus comprising in combination:

a rotating means adapted to rotate about the center axis of the apparatus;

a plurality of supporting mechanisms rotatably held on said rotating means to hold a bottom of each container thereon so that the container is in an upright position, said supporting mechanisms being located at an equal distance along a periphery of a circle on the rotating means;

an endless belt for rotating each of said supporting mechanisms in one direction about the axis of the latter while the latter revolve around the axis of the apparatus;

means for controlling the tension in the endless belt;

said endless belt being disposed along a part of a periphery of the rotating means so as to contact each support mechanism to thereby rotate the support mechanism when the support mechanism passes within a region where the endless belt is disposed; and

a plurality of holding means for firmly holding the containers thereon with the aid of attractive force generated under reduced pressure, a vacuum source generating said reduced pressure, a suction cup being in communication with said vacuum source and cooperating with a frictional disc disposed on a top end part of each supporting mechanism.

4,511,026

APPARATUS FOR THE STORAGE AND MECHANICAL TRANSFER OF STOCK OR MATRIX CAPACITORS

Arno Adler, Bagnolet, France, assignor to L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed Dec. 29, 1982, Ser. No. 454,391
Claims priority, application France, Dec. 31, 1981, 81 24582
Int. Cl.³ B65G 37/00
U.S. Cl. 198—469 1 Claim

1. A system for conveying stock or matrix capacitors in the form of bars, the system comprising:

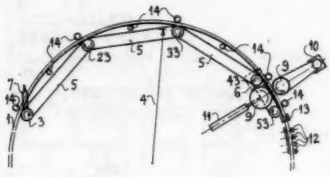
a plurality of threaded means arranged in an arc for supporting a plurality of parallel spaced arcuate bent bars thereon, the bars being transversely oriented with respect to the threaded means;

grooves formed in the threads of the threaded means for receiving the bars therein and retaining them in parallel spaced relation;

means for stopping longitudinal movement of all the bars except an innermost positioned bar;

means for longitudinally moving the innermost bar from an innermost thread of the threaded member to a work station;

control means for detecting longitudinal movement of the innermost bar from the innermost thread to the work station;



drive means connected to the control means for actuating the threaded means simultaneously to transfer all the remaining bars to respective immediately adjacent inward threads thus enabling cyclical operation; and

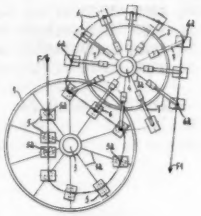
roller means contacting the bars for ensuring they retain an arcuate shape as they are moved from the threaded means to the work station.

4,511,027

METHOD OF AND APPARATUS FOR THE HANDLING OF PRODUCTS BY OPERATIVE MEANS CARRIED IN CONTINUOUS MOVEMENT

Alderino Zamboni, Budrio, Italy, assignor to RISVIN - Ricerche e Sviluppo Industriale - S.r.l., Budrio, Italy

Filed Oct. 8, 1982, Ser. No. 433,552
Claims priority, application Italy, Oct. 23, 1981, 3557 A/81
Int. Cl.³ B65G 29/00
U.S. Cl. 198—478 10 Claims



1. A method of handling articles which comprises the steps of:

mounting said articles in succession upon a plurality of angularly equispaced holders on a first wheel rotatable about an axis by shifting said holders as said wheel rotates to ensure that said holders describe a linear path section during the mounting of said articles on said holders;

thereafter rotating said wheel to arcuately sweep said holders and said articles thereon along at least one further path section including at least one arcuate portion;

thereafter shifting said holders radially as said wheel continues to rotate about said axis while rotating said holders about respective holder axes parallel to the axis of said wheel to maintain a given orientation of said holders along a further linear path section;

rotating a second wheel about a second wheel axis parallel to but spaced from the first mentioned axis of the first mentioned wheel and radially displacing respective holders of said second wheel to align said holders of said second wheel with said holders of the first wheel along said further linear section while angularly displacing said holders of said second wheel about respective holder axes parallel to the axis of said second wheel to maintain a given orien-

tation of said holders of said second wheel during movement along said further linear path section whereby said articles are transferred to said holders of said second wheel; and

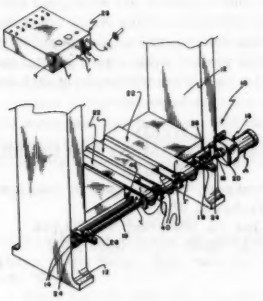
thereafter continuing to rotate said second wheel to displace said holders of said second wheel and the articles therein along still another path section including at least one curve.

4,511,028

GANG CONVEYOR DRIVE MOUNT AND METHOD FOR TRANSPORTING

Richard P. Meister, Newton, Kans., assignor to Bunting Magnetics Company, Newton, Kans.

Filed Apr. 4, 1983, Ser. No. 481,588
Int. Cl.³ B65G *21/00*
U.S. Cl. 198—497 **9 Claims**



1. A gang conveyor drive mount means mountable on a frame base comprising in combination;

a pair of rail means generally securable superimposedly spacedly with respect to each other to the frame base;

a motor-gear box means attached to said pair of rail means;

a drive shaft means drove by and engaged to said motor-gear box means;

at least one conveyor means slidably mounted along said drive shaft means and the upper one of said pair of rail means and extending when mounted over said frame base such that the results of work falls on said conveyor means in order to be transported to a storage or use area;

at least one bracket means slidably mounted along said pair of rail means;

at least one bearing means fixed to said bracket means and slidably mounted along said drive shaft means;

said conveyor means and combined bracket-bearing means adapted in operation of the invention to be slidably adjusted along the drive shaft means and said pair of rail means in order that the gang conveyor drive mount means can be mounted on any given frame base.

4,511,029

APPARATUS FOR TRANSFERRING ARTICLES

Masao Okawa, Nihama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,342
Claims priority, application Japan, Sep. 28, 1981, 56-153306
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—621 **4 Claims**

1. An apparatus for transferring articles comprising:

a stationary main frame;

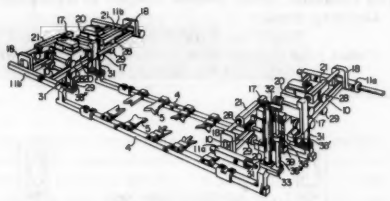
a pair of substantially parallel feed bars;

at least one pair of opposed jaws or claws adapted to hold said article therebetween, each said jaw or claw being provided on each said feed bar;

a pair of movable frames, each being movable with respect to said main frame in a plane in parallel with a plane in which said feed bars extend and including a pair of first beams extending in parallel with said feed bars and a pair of second beams extending perpendicularly to and securely fixed at their ends to said first beams;

a plurality of paired means mounted on said main frame for guiding said first beams, respectively, of each said movable frame to move said movable frame in the direction in parallel with said feed bars;

a pair of carriers movably supported on said second beams of each said movable frame for movement in the direction perpendicular to the movement of said movable frame;



a supporting member movably supported on each said carrier for movement in the direction perpendicular to said plane and securely supporting each end of each said feed bar;

at least one first fluid-operated cylinder for driving at least one of said movable frames;

a second fluid-operated cylinder for driving each said carrier; and

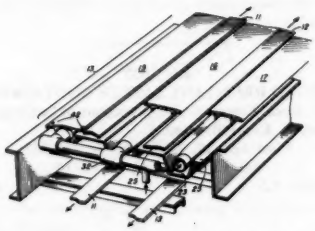
a third fluid-operated cylinder for driving each said supporting member.

4,511,030

ARTICLE ACCUMULATING CONVEYOR SYSTEM

Hans J. Lem, Mahwah, N.J., assignor to Air Lane Systems Inc., Fairfield, N.J.

Filed Mar. 28, 1983, Ser. No. 479,254
Int. Cl.³ B65G *47/74*
U.S. Cl. 198—633 **5 Claims**



1. In a conveyor system of the type in which articles are transported on continuously moving parallel belts, article accumulation apparatus comprising:

interleaved with said belts, a plurality of elongate lifting assemblies each of which includes,

an elongate air bag;

an upwardly facing U-shaped rigid channel member for receiving said air bag;

an inverted U-shaped channel member overlying said air bag, said inverted channel member being relatively flexible in the longitudinal direction;

at each end of each inverted channel member, means for securing the upper surface of the respective end of the

inverted channel member at a level below that of the moving belts;

whereby, when the air bags are inflated, the moving belts can drive successive articles up onto the resulting ramped surface of the inverted channels;

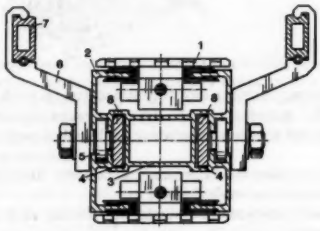
and further comprising respective, mutually engageable lip means on said rigid and flexible channel members for limiting upward movement of said flexible channel member upon inflation of the respective air bag.

4,511,031

CONVEYOR COMPRISING EASILY MOUNTABLE GIRDER SECTIONS

Leif Lachonius, Surte, Sweden, assignor to Aktiobolaget SKF, Goteborg, Sweden

Filed Nov. 3, 1982, Ser. No. 438,915
Claims priority, application Sweden, Dec. 9, 1981, 8107357
Int. Cl.³ B65G *21/20*
U.S. Cl. 198—836 **1 Claim**



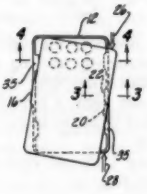
1. A conveyor assembly comprising a series of girders adapted to be mounted in end-to-end relation, each girder being symmetrical about horizontal and vertical planes and defining conveyor belt forward and return paths on opposing horizontal outer sides of each girder, each girder having an integral transverse web portion having at each end, adjacent to a respective upright wall of the girder, a pair of open longitudinally extending side-by-side inner and outer channels, said channels being situated one inside the other, an elongated connecting member engageable in said inner channels and spanning adjacent girders, first mounting means for securing the connecting member to the vertical inner wall of the inner channel and second mounting means for mounting a railing or the like in the outer channels independently of the first mounting means.

4,511,032

CHILD RESISTANT SAFETY CONTAINER

Randall G. Bush, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Apr. 25, 1983, Ser. No. 488,231
Int. Cl.³ B65D *43/10, 85/56*
U.S. Cl. 206—1.5 **15 Claims**



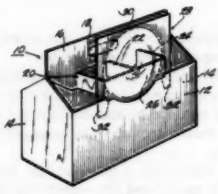
1. A child resistant safety container comprising: a receptacle having a predetermined perimeter, a cover member having a mating perimeter to said predetermined perimeter, a pliable living hinge means holding said cover on said receptacle for pivotal movement between closed and opened positions about a first axis and permitting limited movement of said receptacle and cover about a second axis transverse to said first axis, said receptacle, said cover member and said hinge means being formed as a single unit, and latch means concealed within said container and holding said cover member in closed position relative to said receptacle, said latch means including a hook member having a cam surface for cooperatively engaging a tab formed integrally with said receptacle whereby closing of the container by relative movement of the cover and the receptacle about said first axis causes the cam surface to engage said tab means and push the tab means and latch means away from each other until said hook portion engages the underside of said tab portion with a distinctive sound alerting the operator that the container is closed properly, said cover being releasable from said closed position upon sequential relative twisting movement of said receptacle and cover about said second axis of said hinge means to a position in which said perimeters of said cover member and receptacle are misaligned and overlap each other to permit subsequent lifting of said cover member to an open position, and said cover being engageable with said receptacle in a closed position upon simple pivotal movement of said cover relative to said receptacle about said first axis.

4,511,033

PROMOTIONAL ATTACHMENT FOR BEVERAGE PACKAGES

Ronald J. May, Waukesha, Wis., assignor to American Audiographics, Inc., Waukesha, Wis.

Filed Jan. 16, 1984, Ser. No. 571,114
Int. Cl.³ B65D *77/24;* G09F *3/00*
U.S. Cl. 206—216 **8 Claims**



1. Combination with a beverage container carrier of the type having a multiplicity of individual container retaining means and spaced webs extending between said means and connecting portions of the carrier, of a promotional device attached to the package, the device including a planar message bearing surface and an arm extending therefrom, said arm having a tab which engages one of the webs to resist removal of the arm from engagement with the web.

4,511,034

COMPUTER DISKETTE CASES

You-Chwen Pan, 3 Fl-5, No. 28, Jen Ai Rd. Sec. 3, Taipei, Taiwan

Filed Apr. 23, 1984, Ser. No. 603,062
Int. Cl.³ B65D *85/30*
U.S. Cl. 206—310 **3 Claims**

1. A computer diskette case, comprising a left case body (2) and a right case body (1), wherein a flange (11), (21) is set around a periphery of each case body such that said flanges (11), (21) can mate tightly with each other when said case is closed, and provided with a first cylinder (3) centrally disposed on said right case body (1) and having a top surface and a diameter smaller than the diameter of a center hole of a diskette and a second cylinder (4) centrally disposed on said left case body (2) and having a top surface and a diameter larger than the diameter of said center hole of said diskette, and an elastic tongue plate (5) connected on a lower portion (51) of said right

case body and having a semi-circular opening (52) centrally formed in an upper end thereof, said semi-circular opening (52) having a diameter larger than said first cylinder (3) but smaller than said second cylinder (4), whereby when said case is closed said top surfaces of said first and second cylinders (3), (4) contact one another in cooperation with said elastic tongue

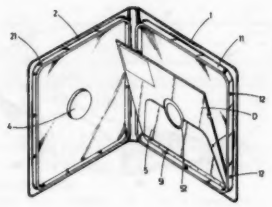


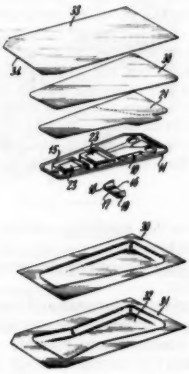
plate (5) such that a diskette contained in said case is clamped between said elastic tongue plate (5) and said right case body (1) by the pressing of said second cylinder (4) thereon while said first cylinder (3) is encircled by a center hole of said diskette and when said case is opened said elastic tongue plate is released to a set angle with respect to said right case body to allow said diskette to be removed from said case.

4,511,035

PACKAGE FOR SURGICAL INSTRUMENT

Marvin Alpern, Glen Ridge, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Jan. 13, 1983, Ser. No. 457,821
Int. Cl.³ B65D *83/10*
U.S. Cl. 206—363 **10 Claims**



1. A package for a sterile instrument, said instrument having a repeating type operation utilizing a flexible driver, said package comprising;

semi-rigid formed means for holding said instrument;

rigid means mounted on said formed means for maintaining said instrument in a position wherein the driver is maintained in an unstressed state to prevent it from taking a permanent set;

an insert covering one side of said semi-rigid formed means for providing ready access to said instrument; and

encasing means for completely surrounding said instrument, semi-rigid formed means, rigid means, insert, and access means for maintaining said instrument sterile.

4,511,036

TIDY ELEMENT PROVIDED WITH SEVERAL COMPARTMENTS

Renato Castelli, Ghent, Belgium, assignor to Samsonite Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 213,736, Dec. 5, 1980, abandoned. This application Sep. 10, 1982, Ser. No. 416,477
Claims priority, application Belgium, Dec. 18, 1979, 880684
The portion of the term of this patent subsequent to Sep. 4, 1996, has been disclaimed.
Int. Cl.³ B65D *43/14, 51/04*
U.S. Cl. 206—371 **8 Claims**

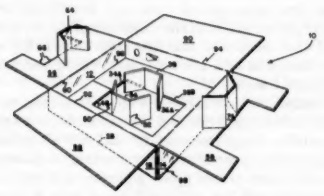
1. A tidy element comprising a substantially flat molded rectangular plastic base adapted to fit in the lid of a traveling case, means for securing said base in said case lid, said base having a bottom, top, sides and partitions dividing said base into a plurality of compartments, a molded lid for at least one of said compartments, said lid having a bottom, top and sides, means at sides of said lid for pivotally connecting said lid to said base to pivot about an axis spaced upwardly from the bottom of said lid, cooperating molded catch portions on the top of said base adapted to interengage with one another to secure said lid releasably in closed condition, molded release means on the top of said lid manually engageable to release said catch means and open said lid extending below the pivot axis of the lid and being engageable with the bottom of said base to limit the opening of said lid.

4,511,037

BOX FOR WRAPPING AND TRANSPORTING FLEXIBLE CORDLIKE STRUCTURE

Robert W. Lucous, 1690 S. Shiloh Rd., Laura, Ohio 45337

Filed Jan. 16, 1984, Ser. No. 570,931
Int. Cl.³ B65D *85/67*
U.S. Cl. 206—396 **6 Claims**



1. A box for transporting and storing a flexible cord-like material, comprising:

(a) four sidewalls, said sidewalls being perpendicular to a first predetermined plane and arranged in end to end relationship to form an endless enclosure with front and rear openings, each of the sidewalls being perpendicular to adjacent sidewalls;

(b) a first flap panel hingedly secured to one of the sidewalls about a first fold line extending parallel to said first predetermined plane, said first flap panel being foldable into the rear opening and at least partially closing the rear opening when positioned in parallel relationship to said first predetermined plane;

(c) a second flap panel hingedly secured to another of the sidewalls about a second fold line parallel to the first fold line, said second flap panel being foldable into the rear

opening and at least partially closing the rear opening when positioned in parallel relationship to said first predetermined plane, said first and second fold lines defining a second plane parallel to the first predetermined plane; and

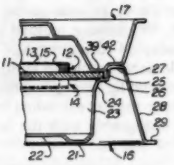
(d) a foldable core panel formed in both the first and second flap panels, each of said core panels being formed by opposing L-shaped slits, each of the L-shaped slits including a first leg extending inwardly toward the corresponding fold line from the side of the flap panel opposite the fold line with a second leg of each L-shaped slit extending parallel to the fold lines toward the opposing L-shaped slit, said foldable core panels being foldable along core fold lines extending parallel to the first and second fold lines and joining the second legs of the two opposing L-shaped slits, said core panels including a pair of fold lines extending from the ends of the second legs in a direction perpendicular to the core fold lines.

4,511,038

CONTAINER FOR MASKS AND PELLICLES

Anne K. M. Miller, Redwood City, and Richard Mason, Campbell, both of Calif., assignors to EKC Technology, Inc., Hayward, Calif.

Filed Jan. 30, 1984, Ser. No. 574,743
Int. Cl.³ B65D *85/48, 81/16*
U.S. Cl. 206—454 **16 Claims**



1. A container for a mask of the type having a thin, fragile body having a regular peripheral first shape comprising a first part and a second part, one of said parts being a base and the other said part being a cover,

said first part comprising a first surface, first inner sides extending from said first surface, a first ledge beyond said first inner sides having a second shape complementary to said first shape, a peripheral first edge, first means spacing said first edge spaced from said first ledge farther from said first surface than the thickness of a conventional mask and also outwardly, said first inner sides being higher than the thickness of a conventional pellicle used with a conventional mask,

said second part comprising a second surface, second inner sides extending from said second surface, a second ledge generally complementary to said first shape said second ledge being spaced from said first ledge a distance equal to the thickness of said mask, whereby said body when positioned on said first ledge is clamped only at its outer edges between said first and second ledges, a second ledge dimensioned to abut said first edge in the assembled condition of said container, and second means spacing said second edge spaced from said second ledge closer to said second surface than said second ledge and also outwardly, said second inner sides being higher than the thickness of a conventional pellicle.

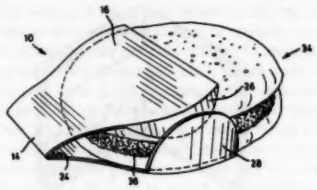
4,511,039

HAMBURGER HOLDER

Stanislaw Siemek, 58 Elsfield Rd., Toronto, Ontario, Canada

Filed Sep. 22, 1983, Ser. No. 534,882
Int. Cl.³ B65D *5/36, 85/00*
U.S. Cl. 206—525 **4 Claims**

1. A hamburger holder comprising a body member formed of a semi-rigid material, the body member having a central portion, a first end portion formed with a first generally U-shaped open jaw, and a second end portion formed with a second generally U-shaped open jaw, the first jaw being narrower and shallower than the second jaw to enable the first jaw to enter the second jaw, and the body member being adapted to permit pivoting of the first jaw about the central portion towards the second jaw between an open position in



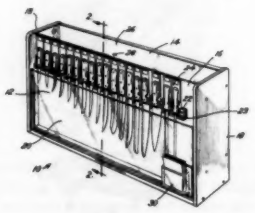
which a hamburger can be received in the jaws and a closed position in which the jaws are orientated substantially in aligned opposing relationship with the first jaw contacting one of the top and the bottom of the hamburger and overlaying the side of the hamburger and with the second jaw contacting the other of the top and bottom of the hamburger and overlaying the side of the hamburger.

4,511,040

DISPLAY CASE

John Tolentino, Muskego, Wis., assignor to Chicago Cutlery Consumer Products, Inc., Minneapolis, Minn.

Filed Apr. 7, 1983, Ser. No. 482,923
Int. Cl.³ B65D *1/22;* A47F *7/00*
U.S. Cl. 206—553 **6 Claims**



1. A display case for exhibiting cutlery or similar articles comprising, in combination:

a container having a forward display portion and a rearward storage portion;

a divider separating the forward and rearward portions;

means for carrying cutlery in the rearward storage portion, said means comprising a plurality of slotted blocks mounted within the rearward storage portion, the slotted blocks being slidably insertable within the rearward storage portion of the display case;

means for supporting cutlery on the divider, said means mounted on the divider and comprising a cutlery support frame having a groove, and a complementary tongue affixed to the divider, the tongue being T-shaped in cross-section and the groove being T-shaped in a size complementary to the T-shaped tongue; and

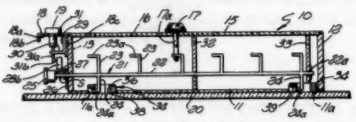
a transparent cover for the forward display portion positionable on the container, the transparent cover screening the sharp portions of the displayed cutlery, the transparent cover further comprising a generally transparent sheet slidably attached to the container forward of both the divider and the means for supporting cutlery on the divider.

4,511,041

JEWELRY DISPLAY TRAY AND SECURITY SYSTEM

Michael D. Waitzman, 11762 Iowa Ave., No. 8, West Los Angeles, Calif. 90025

Filed Jan. 30, 1984, Ser. No. 575,074
Int. Cl.[3] B65D 1/34; A47F 7/24; E05B 73/00
U.S. Cl. 206—566 6 Claims



1. A store display tray for ring or loop shaped jewelry items including a security system for protecting against the theft of such items comprising:

(a) a display tray formed of a base member, a front wall, a rear wall, side walls and a top display member, said top member having a multiplicity of rows of slots therein for receiving the ring or loop shaped jewelry items to be displayed on said tray;

(b) a multiplicity of shiftable lock means within said tray and each positioned below and in alignment with a row of slots in said top display member, said shiftable lock means each having a portion thereof extending through the rear wall of said tray, said lock means bearing upwardly extending catch elements for locking engagement with the downwardly extending ring or loop shaped portion of the items displayed on the tray in the slots thereof when said lock means are in their respective lock positions, and one or more of said lock means bearing downwardly extending tray security elements for engagement with mounting means affixed to a counter top when said one or more lock means are in their respective lock position for locking said tray to said counter top;

(c) force biasing means comprising springs associated with each of said shiftable lock means and surrounding the extending portion thereof for maintaining said lock means in their lock positions; and

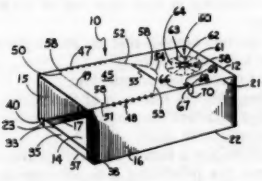
(d) push knobs affixed to the end of the extending portion of each shiftable lock means for shifting said lock means to their respective unlock positions, said knobs positioned so that when a pushing force is applied thereto the springs surrounding said extending portions of said lock means are compressed and said lock means are shifted to their respective unlocked positions until said pushing force is terminated.

4,511,042

COMBINATION SNACK FOOD TRAY

Henry Wischusen, III, Lilburn, Ga., assignor to Rock-Tenn Company, Norcross, Ga.

Continuation of Ser. No. 414,952, Sep. 3, 1982, abandoned. This application May 21, 1984, Ser. No. 611,931
Int. Cl.[3] B65D 5/54
U.S. Cl. 206—611 4 Claims



1. A tray of paperboard or the like, for receiving a drink container and a food container, comprising:

a top panel and a bottom panel, held in spaced apart relation by a pair of side panels foldably connected along linear scores to said top and bottom panels, a glue flap extending from said bottom panel and being adhered to the adjacent side panel, said panels and glue flap forming a collapsible tubular enclosure having a substantially open interior, said enclosure having first and second ends each defined by coplanar edges of said top, bottom and side panels;

said first end being closed by automatic end closure flaps extending from said edges of said top, bottom and side panels;

said second end being substantially open and comprising a retaining panel defined in said bottom panel by a transverse score spaced inwardly from the coplanar edge of said bottom panel and extending between said side panels, said side panels each defining a diagonal score extending from an end of said transverse score to meet the coplanar edge of said side panel intermediate the foldably connected edges thereof, and said glue flap defining a diagonal score matching the diagonal score of the side panel to which said glue flap is adhered;

drink-receiving means defining in said top panel adjacent to said first end, for receiving a drink container, comprising a circular score and a plurality of radial break-away cuts extending from said circular score essentially to the center of said circular score, said drink-receiving means substantially enclosing the area within said circular score; and

a tear-away panel comprising an area of said top panel between said circular score and said second end, said tear-away panel being defined by parallel zipper rules extending along the foldable connections between said top panel and said side panels, a first transverse line of perforation extending across said top panel adjacent to said second end to join said zipper rules, and a second transverse line of perforation extending across said top panel adjacent to said circular score to join said zipper rules;

said second transverse line of perforation defining intermediate the ends thereof a tab connected to said tear-away panel by a transverse fold line, said tab being foldable into said enclosure to enable grasping of said tear-away panel;

said zipper rules comprising a plurality of spaced apart linear cut scores defining a path of tearing, and a plurality of semi-circular cut scores, each semi-circular cut score intersecting an end of one of said linear cut scores intermediate the ends of said semi-circular score, and extending such that both ends of said semi-circular score intersect a line drawn normal to the near end of the next adjacent linear cut score;

whereby said food container can be inserted into said enclosure through the open second end thereof, retained by folding said retaining panel into the open end, and protected by said top panel until being exposed by removal of said tear-away panel, and whereby said drink-deceiving means protects said food container prior to insertion of said drink container therein.

4,511,043

EASY OPENING CARTON

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 19, 1983, Ser. No. 533,214
Int. Cl.[3] B65D 5/72
U.S. Cl. 206—620 16 Claims

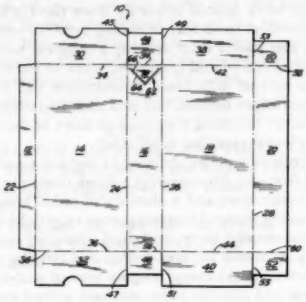
1. A generally rectangular easy opening carton made from a single sheet of paperboard material, said carton comprising:

opposed rectangular front and back walls, opposed rectangular first and second side walls, said first and second side walls being perpendicular to and extending between said front and back walls, and opposed rectangular top and bottom walls, said top and bottom walls being perpendicular to and extending between said front, back and first and second side walls;

said top and bottom walls including opposed dust flaps articulated to each said first and second side walls, a back

end flap articulated to said back wall and a front end flap articulated to said front wall; and

said first side wall being of a single thickness of paperboard material and including a spaced parallel array of perforation lines, each perforation in each line of perforations being alternately offset from each perforation in each adjacent and parallel line of perforations along the longitudinal axis of said parallel array of perforation lines thereby weakening a wide area of said paperboard material, the perforations of said perforation lines extending



into the paperboard material from the same exterior surface of the paperboard material said parallel array of perforation lines being adjacent said top wall and extending toward said bottom wall thereby defining means including an easy opening area whereby when the easy opening area is pressed inwardly in said carton the wide weakened area permits the paperboard material to be easily broken thereby separating the easy opening area from said first side wall along the parallel array of perforation lines thus allowing said top wall and adjacent dust flap to be torn back to easily open said carton.

4,511,044

SEAL FORCE MONITOR APPARATUS, SYSTEM, AND METHOD FOR IN-PROCESS DETERMINATION OF INTEGRITY OF SEALED CONTAINERS

John T. Connor, Norristown; Charles P. Halsted, Oreland, both of Pa., and Jacob Ravn, Solvang, Calif., assignors to The West Company, Phoenixville, Pa.

Filed Feb. 24, 1982, Ser. No. 351,660
Int. Cl.³ B07C *5/34*; G01M *3/00*
U.S. Cl. 209—522 **10 Claims**

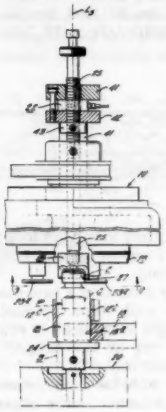
2. A system for determining the integrity of sealed container-closure assemblies in a system for applying closures having a resilient sealing element to a container, said system comprising force applying means for positioning said container and for securing said closure to said container in a closure operation and apparatus for monitoring said closure operation, said apparatus comprising:

force sensing means, connected to said force applying means, for sensing the force used in securing said closure to said container and for generating a force signal reflective of said force;

reference means for generating a reference signal reflective of the force used during a closure operation of an acceptably sealed container-closure assembly;

comparison means, connected to said force sensing means and said reference means, for comparing the force signal generated at a plurality of points during said closure operation to corresponding points of said reference signal and for generating a comparison signal each time said force signal and said reference signal are not within a predetermined range; and

counting means, connected to said comparison means, for counting the comparison signals and generating an indica-



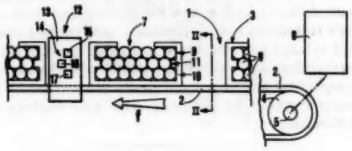
tion signal when the number of comparison signals for single closure operation, exceeds a preselected number.

4,511,045

DEVICE FOR TRANSFERRING AND VERIFYING BATCHES OF CIGARETTES

Enzo Seragnoli, Bologna, Italy, assignor to G.D. Società Per Azioni, Bologna, Italy

Filed Jan. 28, 1982, Ser. No. 343,753
Claims priority, application Italy, Mar. 6, 1981, 3358 A/81
Int. Cl.³ B07C *5/00*
U.S. Cl. 209—535 **2 Claims**



1. A device for transferring and verifying batches of cigarettes, comprising:

conveyor means for moving said batches, said means having compartments for holding said batches of cigarettes placed transversely with respect to the direction in which the conveyor means moves forward, and arranged in layers at different levels with respect to said conveyor means;

means for checking at least one end of each of said cigarettes; and

means for ejecting batches that are incomplete or contain at least one faulty cigarette;

said means for checking comprising:

a detecting element for each of said layers of cigarettes arranged to detect the continguous ends of the grouped cigarettes of a batch,

a first circuit block means for each of the said detecting elements, for producing a signal corresponding to an operation of checking a layer for indicating the existence of a faulty cigarette in a batch,

link means, connected to mechanical means for driving said conveyor, for producing a cyclic signal for synchronizing the checking operation of a layer, said cyclic

signal comprising a succession of impulses synchronizing the moments when said detector elements examine central areas of the ends of the cigarettes,

a second circuit block means for synchronizing with said cyclic signal and for operating said ejector means in response to said first circuit block means signals, and

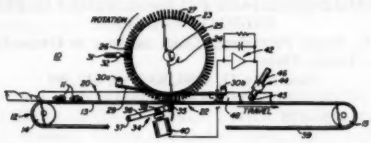
circuit means for selectively inhibiting the response of said second block means to the signal produced by one of said first circuit block means.

4,511,046

METHOD AND APPARATUS FOR DETECTING AN IRREGULAR PRODUCT IN A PRODUCT FLOW

Richard J. Walsh, Yuba City, and Darrell D. Gyles, Sutter City, both of Calif., assignors to Sunsweet Growers of California, Calif.

Filed Mar. 7, 1983, Ser. No. 472,428
Int. Cl.³ B07C *5/09, 5/34*
U.S. Cl. 209—539 **17 Claims**



1. Apparatus for detecting and intercepting an irregular product in a product flow, comprising:

means for conveying said product flow along a path;

means along said path for aligning said product flow in a single file manner;

a cylinder positioned along said path downstream of said aligning means, said cylinder being rotatable in the same direction as that of said product flow about an axis transverse to said path;

a plurality of elongate pin like projections extending radially from said cylinder at spaced locations, said projections capable of impaling each acceptable product coming in contact therewith;

means for detecting a pressure increase on said conveying means caused by downward deflection thereof due to resistance of an irregular product to impaling by said pin-like projections, and for generating a signal upon detection of said pressure increase; and

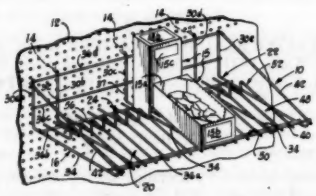
means for removing said irregular product from said product flow in response to said signal.

4,511,047

PRODUCT DISPLAY AND STORAGE SHELF SYSTEM

Howard S. Elinsky, University Heights, Ohio, assignor to Electroline Manufacturing Company, Cleveland, Ohio

Filed Nov. 24, 1982, Ser. No. 444,453
Int. Cl.³ A47F *5/08*
U.S. Cl. 211—90 **12 Claims**



1. A product display and storage shelf connectable to a shelf supporting structure comprising:

(a) connecting structure by which the shelf is attachable to a shelf supporting structure;

(b) product supporting display means spaced from and projecting away from the connecting structure when the shelf is installed to define sides distal and proximal the connecting structure, said display means constructed to support product thereon between said distal and proximal sides for removal by users from said distal side;

(c) product supporting storage means disposed between said display means and said connecting structure;

(d) fulcrum means between said storage means and said display means for enabling product supported by said storage means to be moved into engagement with the fulcrum means, tipped and slid onto said display means; and,

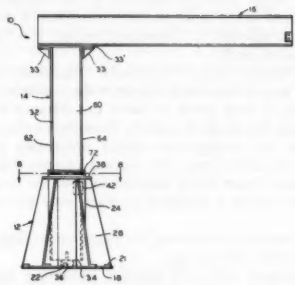
(e) stop means for preventing product from falling from the distal side of said display means.

4,511,048

JIB CRANE SYSTEM HAVING A ROTATABLE MAST

John G. Volakakis, La Grange; Robert L. McNelis, Glen Ellyn, and Burt H. Wallentin, La Grange, all of Ill., assignors to Handling Systems, Inc., La Grange, Ill.

Filed Jun. 4, 1982, Ser. No. 384,883
Int. Cl.³ B66C *23/84*
U.S. Cl. 212—253 **4 Claims**



1. A crane comprising:

a base means;

a rotatable mast having a lower end portion and upper end, said mast being I-shaped and having a body portion sandwiched between and integrally formed to opposed side portions;

a load beam rigidly secured to the upper end of the mast and extending laterally outward therefrom to a free end, said load beam rotating with the mast as the mast is rotated;

a hollow pipe secured to the base means, said pipe being spaced from and surrounding said lower end portion of the mast;

a bearing means;

a pin extending downward from said lower end portion of the mast and operatively received in said bearing means;

a bearing cup mounted on said base means and operative to hold said bearing means for rotating said mast and load beam;

a notch formed in one of said side portions and in an adjacent section of said body portion of said mast;

a substantially rectangular cage; and

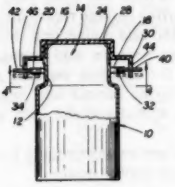
a pair of rollers means rotatably attaching said rollers to the inside of said cage for rotation about spaced vertical axes, said cage being received in said notch and attached to said body portion, said rollers contacting the inside surface of said pipe on the side thereof facing the free end of the load beam and revolving therearound as the mast is rotated.

4,511,049

SAFETY CLOSURE AND CONTAINER

Fred G. Aboud, 3812 Taylorsville Rd., Louisville, Ky. 40220

Filed Mar. 19, 1984, Ser. No. 591,052
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—216 **19 Claims**



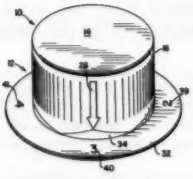
1. A safety closure and container, the safety closure for sealingly closing the opening into the container, comprising:
the container having a generally cylindrical neck defining the opening into the container;
threads formed in the outer peripheral surface of the container neck;
at least one locking lug projecting generally radially outwardly from the container neck, the locking lug being located below the threads on the container neck;
the closure having a first generally cylindrical flange of a diameter larger than the diameter of the container neck;
threads formed in the inner peripheral surface of the closure first flange adapted to threadably engage the threads of the container neck;
the closure having a second generally cylindrical flange of a diameter larger than the diameter of the container neck by an amount at least equal to twice the distance by which the locking lug projects radially from the container neck;
at least one lug engagement finger projecting generally radially inwardly from the second closure flange, the engagement finger being adapted to abut the locking lug when the closure is threaded in place over the container neck;
means for resiliently mounting the engagement finger to the second closure flange; and,
means associated with the resilient mounting means for selectively displacing the finger out of abutment with the locking finger thereby allowing the closure to be unthreaded from the container neck.

4,511,050

DOSE INDICATOR CLOSURE

Irene L. Nicol, 225 Cloverdale, Villas, N.J. 08251

Filed May 2, 1984, Ser. No. 606,402
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—219 **4 Claims**



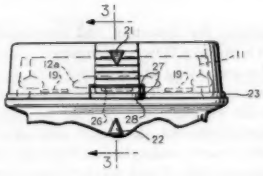
1. A closure for containers having an exteriorly threaded portion comprising, in combination: An outer cap member having a circular top panel integrally formed with a substantially cylindrical-shaped skirt portion depending perpendicularly downward to an open bottom, the face of said bottom being formed in the contour of a plurality of general dyhedrals, said outer cap member having an indicator means; an inner cap member having substantially a circular top panel integrally formed with a depending skirt portion, said depending skirt portion of said inner cap member loosely nested within said depending skirt portion of said outer cap member to allow relative rotary and axial movement between said inner and outer cap members, said inner cap member having threads formed on the interior surface thereof for engagement with said threaded finish portion of said container, a radially formed flange portion extending outwardly from an open bottom of said inner cap member, said flange portion having formed in combination, a set of graduated indicia clearly observable on the top face, an annular track being formed on the upper face of said flange portion, said annular track beginning at the hub of said flange portion and extending outwardly to substantially the width of the thickness of the depending skirt portion of said outer cap member, said annular track being formed with an alternating dyhedral configuration matching the contour of the base of said outer cap member.

4,511,051

CHILD-RESISTANT PACKAGE WITH TAMPER INDICATING DEVICE

Kirit C. Desai, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 21, 1984, Ser. No. 612,498
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—225 **20 Claims**



1. A child-resistant package with a snap-on closure comprising
a container having a neck finish,
said neck finish including a retaining bead having at least one notch therein,
a closure having a top and a peripheral skirt,
a first radially inwardly extending locking lug on the inner surface of said skirt adapted to be aligned with said notch to permit removal of said closure,
said skirt having a portion with a radially inwardly extending lug thereon spaced circumferentially from said locking lug on said closure and underlying said first mentioned bead on said container such that when the first mentioned locking lug is aligned with a notch in the annular bead, the closure cannot be removed until the portion of the skirt having the lug thereon is moved away from its relationship with the remainder of the skirt of the closure and in order that the lug thereon will not interfere with removal of the closure.

4,511,052

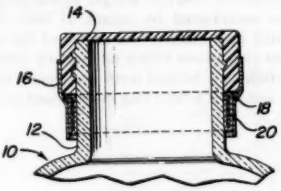
CONTAINER SEAL WITH TAMPER INDICATOR

Howard J. Klein, 14212 Matisse Ave., Irvine, Calif. 92714, and Gabor L. Szekeres, 18082 Dorchester Cir., Villa Park, Calif. 92667

Filed Mar. 3, 1983, Ser. No. 471,870
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—230 **15 Claims**

1. A sealing device for a container having removable closure means placed on a neck of the container, comprising:
a peelable band sealingly engaging the periphery of said closure means;
a hermetically sealed frangible envelope disposed between

the neck of the container and the peelable band and being adhesively attached to both the band and the neck, and indicating means, for changing appearance in response to exposure to the ambient environment, contained within



the sealed frangible envelope whereby the removal of said band ruptures the sealed envelope and exposes said indicating means to the ambient environment, the resultant change of appearance being visible from exterior of the container.

4,511,053

LID FOR A CONTAINER NECK PROVIDED WITH A THREAD OR UNDERCUT SHOULDER

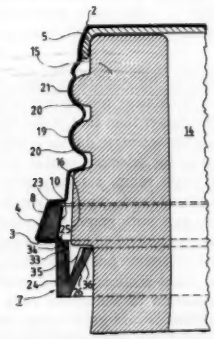
Carlos E. Brandes, Worms, and Gunter Spatz, Biblis, both of Fed. Rep. of Germany, assignors to Alcoa Deutschland GmbH, Worms, Fed. Rep. of Germany

Filed Feb. 16, 1983, Ser. No. 467,081

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206245; Jul. 23, 1982, 3227510

Int. Cl.³ B65D *41/34*

U.S. Cl. 215—252 **26 Claims**



1. A two-piece lid for a container neck provided with a thread or undercut shoulder comprising:

(a) a lid member having a lower circumferential side edge and a circumferential sidewall protrusion extending outwardly at the lower edge of the lid member for defining therein a ring-positioning space; and

(b) a ring of synthetic material of a substantially Z-shaped cross-section including (i) an upper part, the upper part having a circumferential protrusion for fitting into the ring-positioning space and acting outwardly against the sidewall protrusion, (ii) a lower part having a lip protruding obliquely upwardly and inwardly for acting beneath the container neck shoulder, the lower part having no outwardly extending protrusion, and (iii) an intermediate circumferential region of reduced tear resistance during opening of the lid, the intermediate region being located between the upper and lower parts of the ring and positioned at or below the lower edge of the lid member.

4,511,054

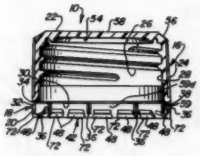
TAMPER-EVIDENT CLOSURE AND METHOD OF MANUFACTURE

Brian E. Shank, Rothsville, Pa., assignor to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.

Filed Apr. 13, 1984, Ser. No. 600,161

Int. Cl.³ B65D *41/34*

U.S. Cl. 215—252 **13 Claims**



1. A method of manufacturing a tamper-evident closure, the method comprising the steps of:

molding a blank which comprises an internally threaded cap, a generally cylindrical ring disposed beneath the cap and spaced therefrom, breakable connecting posts extending downward from the cap radially inward of the ring, and a plurality of gaging posts, each disposed adjacent one of the connecting posts and having a radial dimension smaller than that of the adjacent connecting post, and

making a circumferential cut through the ring to divide the ring into an upper portion and a lower portion, the cut extending through the thickness of the ring and partially but not entirely through the gaging posts.

4,511,055

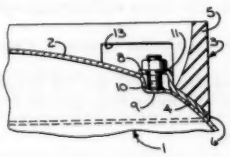
REMOVABLE PROTECTIVE SKIRT FOR A TANK

Franklin J. Carlson, 1081 Wisconsin Ave., Okauchee, Wis. 53069

Filed Jan. 10, 1983, Ser. No. 456,625

Int. Cl.³ F17C *13/08*

U.S. Cl. 220—69 **3 Claims**



1. A tank assembly, comprising a steel tank having a dome-shaped head, a plurality of threaded studs extending outwardly from the head and arranged in a generally circular pattern, a metal ring having a plurality of outwardly extending projecting areas with each area having an opening to receive one of said studs, an annular resilient skirt bonded to the outer surface of said ring, and a plurality of nuts each engaged with one of said studs to secure said ring and said skirt to said head said head being provided with a plurality of flats aligned with said areas, each flat being disposed in a plane perpendicular to the axis of said tank, each of said studs being secured to a flat and extending axially of said tank.

4,511,056

CLOSURE ASSEMBLY PARTICULARLY FOR A RADIATOR FILLER TUBE OF A MOTOR VEHICLE

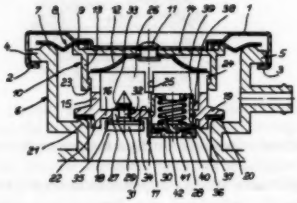
Heinrich Reutter, Waiblingen, Fed. Rep. of Germany, assignor to Reutter Metallwarenfabrik GmbH, Waiblingen, Fed. Rep. of Germany

Filed Dec. 14, 1982, Ser. No. 449,612

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150231

Int. Cl.³ B65D *51/16*

U.S. Cl. 220—204 **8 Claims**



1. A closure assembly particularly useful as a radiator cap for a radiator filler tube of a motor vehicle comprising connecting means for removably fastening said closure assembly upon a member to be sealed, an inner cap assembly including means adapted to be brought in sealing engagement with said member to be sealed, and valve means operatively mounted in said inner cap assembly, said valve means comprising both a vacuum valve and an excess pressure valve, wherein said inner cap assembly comprises a plate member, wherein said vacuum valve and said excess pressure valve each include seat means and a valve member adapted to engage said seat means to open and close said valve, wherein said seat means of said excess pressure valve and of said vacuum valve are formed on said plate member of said inner cap member, and wherein said plate member includes a cupped portion defining a cupped recess, said cupped portion having said seat means of said excess pressure valve defined thereon with said seat means being arranged to define orifice means formed in said cupped recess, with a cover member being provided in snapped engagement with said inner cap assembly, said cupped portion and said cover member defining therebetween said excess pressure valve.

4,511,057

CAP FOR THE TEMPORARY HERMETIC CLOSURE OF CYLINDRICAL TIN CANS WITH PULL-OFF OPENING TAB

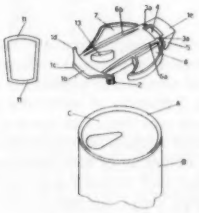
Sergio Tontarelli, Via Mordini Ciriaco, 37, Castelfidardo (AN), Italy

Filed Dec. 8, 1983, Ser. No. 559,280

Claims priority, application Italy, Dec. 15, 1982, 17929 A/82

Int. Cl.³ B65D *41/16, 41/18*

U.S. Cl. 220—306 **7 Claims**



1. Cap for the temporary hermetical closure of cans with a pull-off opening tab, characterized by an irregularly shaped, molded plastic piece, where there can be found a fairly large central body from which jut two diametrically opposed parts; a head-part with two side curved projections, and the other part consisting of an almost rectangular bracket attached to the central body by two thin, narrow bridges having flexing action under pressure accentuated by means of two transversal grooves provided oppositely in the center of the same, and from the curved projections which jut laterally from the said head-part, protrude two hooked teeth completely rigid given their thickness and their solid fixing in said head-part.

4,511,058

SPOKE DISPENSER FOR SPOKED WHEELS IN A SPOKE-FITTING MACHINE

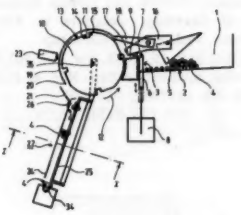
Julien Carminati, Annecy-le-Vieux, France, assignor to Centre de Production Mecanique, Epagny, France

Filed Jul. 28, 1982, Ser. No. 402,745

Claims priority, application France, Aug. 3, 1981, 81 15318

Int. Cl.³ B23Q *7/18*

U.S. Cl. 221—2 **8 Claims**



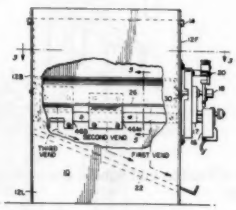
1. A dispenser of spokes for spoked wheels, each spoke formed by a cylindrical rectilinear rod having a head at one end thereof of a diameter larger than that of the rod, comprising a spoke reservoir, a knife selection device positioned at the outlet end of the reservoir for selecting spokes and disposing them on a downward guide ramp, a rotary drum mounted adjacent the outlet end of said guide ramp for rotational movement about a transverse axis with respect to the feed travel direction of the spokes, peripheral grooves arranged on the surface of said drum and extending parallel to the axis of rotation of said drum, the cross-section of said grooves being greater than the cross-section of the spoke rods, the drum being disposed down-stream of said guide ramp for introduction of the spokes into said grooves, and a discharge ramp disposed on the side of said drum opposite said guide ramp to collect and guide the spokes after their travel on the drum, so that rotation of the drum transports the spokes from said downward guide ramp to said discharge ramp, said discharge ramp comprising two inclined and substantially parallel guide surfaces facing one another at a predetermined distance apart so as to allow a spoke to slide there between, the first guide surface being smooth and having a width at least equal to the length of the spoke, the second guide surface being made from an adherent material and having a smaller width than said first guide surface so as to allow free rotation of the spoke head, the distance between the two surfaces being greater than the diameter of the spoke rod and less than half the sum of the diameter of the rod and the distance of the end of the spoke head to the axis of the rod, so that the second surface creates a rotation torque on said spoke during sliding thereof whereby the spoke head slidingly engages the first guide surface and remains in a position upwards with respect to said rod.

4,511,059

VENDING MACHINE WITH SIDE MOUNTED ESCROWS

Marvin R. Manzer, Chattanooga, Tenn., assignor to Cavalier Corporation, Chattanooga, Tenn.

Filed May 26, 1983, Ser. No. 498,560
Int. Cl.³ G07F *11/10*
U.S. Cl. 221—115 **26 Claims**



1. A dispensing assembly comprising:
(a) a storage zone including a plurality of group zones and adapted to store articles in each group zone;
(b) an escrow zone below said storage zone;
(c) a gating member blocking movement of articles from said storage zone to said escrow zone and operable for simultaneously releasing one article from each group zone for movement into said escrow zone;
(d) a dispensing zone disposed below said escrow zone;
(e) a first escrow member in said escrow zone and operable:
I. in a holding position to prevent an article released by said gating member from dropping through said escrow zone to said dispensing zone, and
II. in a free position to allow an article released by said gating member to drop from said escrow zone to said dispensing zone; and
(f) an actuator for causing movement of said gating member; and
wherein said gating member is disposable in a first position to block movement of said first escrow member from its holding position to its free position such that, when said gating member releases a plurality of articles simultaneously, at least one article is held in said escrow zone by said first escrow member and at least one article freely moves from said storage zone to said dispensing zone; and wherein said gating member is disposable in a second position to release said first escrow member for movement from its holding position to its free position to free any article held by said first escrow member for dropping into said dispensing zone.

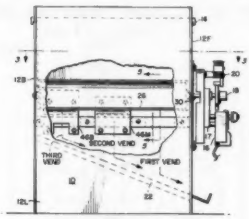
4,511,060

ANTITHEFT SIDE MOUNTED ESCROWS FOR VENDING MACHINE

James C. Lindsey, Chattanooga, Tenn., assignor to Cavalier Corporation, Chattanooga, Tenn.

Filed Jun. 9, 1983, Ser. No. 502,626
Int. Cl.³ G07F *11/10*
U.S. Cl. 221—115 **25 Claims**

1. A dispensing assembly comprising:
(a) a compartment with front, back, right side side, and left side walls;
(b) a storage zone in said compartment and adapted to selectively store a plurality of cylindrical articles in:
I. an n column mode with the articles disposed in n axially-aligned vertical column zones extending from said front wall to said back wall, n is an integer ≥ 2, and
II. an $(n-1)$ column mode with the articles disposed in $(n-1)$ vertical column zone(s), each said $(n-1)$ column zone overlapping at least two of said n column zones;
(c) a dispensing zone below said storage zone; and
(d) a first gate removably mounted in said compartment and operable to gate cylindrical articles into said dispensing zone, said first gate movable between:
I. a holding position wherein it prevents an article from dropping into said dispensing zone, and
II. a free position wherein it allows an article to drop into said dispensing zone; and



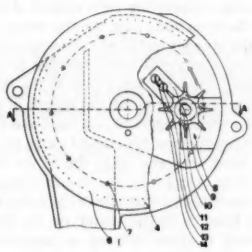
wherein said first gate can not be removed when it is disposed in said holding position and can not be removed when it is disposed in said free position and said first gate can be removed when disposed in between said holding position and said free position.

4,511,061

STIRRER-FEEDER FOR PNEUMATIC DISTRIBUTORS DRILLS

Luigi Gaspardo, Via Mussons 7, Morsano Al Tagliamento (PN), Italy

Filed Apr. 25, 1983, Ser. No. 488,262
Int. Cl.³ A01C *7/04*
U.S. Cl. 221—200 **5 Claims**



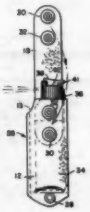
1. A stirr-feeder for seeds, comprising:
a housing (**1**) defining a space;
a disc (**4**) rotatably mounted in said space and dividing said space into a seed chamber (**2**) on one side of said disc adapted to receive a supply of seeds, and a reduced pressure chamber (**3**) on an opposite side of said disc adapted to be subject to a reduced pressure, said disc having a plurality of holes (**6**) therethrough distributed around said disc near an outer periphery thereof;
a star-shaped body (**8**) rotatably mounted to said housing and disposed in said seed chamber for rotation in said seed chamber, said body having a plurality of radial flexible extensions, said body disposed in said seed chamber so that flexible extensions glide adjacent said holes as said holes pass said body with rotation of said disc; and
drive means engaged with said star-shaped body for rotating said star-shaped body with rotation of said disc whereby seeds in said seed chamber are stirred by said radial flexible extension to cause no more than one seed to be engaged with each hole.

4,511,062

CANISTERS FOR PRESSURIZED GAS AND PERSONAL SECURITY DEVICES UTILIZING SAME

William E. Wilkerson, 10201 Harwin, Iown Park-110, Houston, Tex. 77036

Filed Sep. 28, 1981, Ser. No. 306,528
Int. Cl.³ B67D *5/08*; B65D *83/14*
U.S. Cl. 222—47 **1 Claim**



1. A personal security device comprising, in combination, an elongate canister having a discharge nozzle with an operating plunger at the top of the canister adapted to be depressed by thumb pressure for discharging from the canister contents such as tear gas, and an elongate holster in which the canister is received snugly with the nozzle having a discharge opening at one side of the holster, the holster including a main body part and a fold-over flap with fastener means to secure an end of the flap to the main body part with the flap extending over the nozzle and with the flap and the main body part defining an opening by which the contents of the canister may be discharged through the nozzle at said one side of the holster, the flap being sufficiently flexible to permit the thumb of a user's hand to depress the plunger of the nozzle while the canister is in the holster, the fastener means comprising a pair of snap fasteners having cooperating parts spaced along the length of the flap and the main body part, the flap being of a length to fit over top of the plunger and to preclude pivoting of the flap by thumb pressure that could cause the flap to obscure the discharge opening, the main body part of the holster having an elongate ridge extending along the length of said one side of the holster to engage fingers of said hand and the opposite side of the holster being smoothly curved along its length to fit the palm of the hand, whereby when the device is grasped in the user's hand in an emergency, the fingers engage said ridge by feel and the smoothly curved side of the holster fits in the palm of the user's hand, with the thumb on the flap, and the discharge opening is aimed toward an assailant automatically when the ridge is oriented toward the assailant.

4,511,063

SELF SUPPLYING HAWK

Glenn C. Krause, Humble, Tex., and Joseph Blounts, Las Vegas, Nev., assignors to The Hoddie Corporation, Inc., Houston, Tex.

Filed Jun. 6, 1983, Ser. No. 501,109
Int. Cl.³ B67D *5/12*
U.S. Cl. 222—75 **2 Claims**

1. An apparatus for supplying cementatious material to a workman, which comprises:

(a) a flat plate having a hole therethrough;

(b) a handle having a bore therethrough rigidly affixed to said plate at one end, said bore being aligned with said hole in said plate;

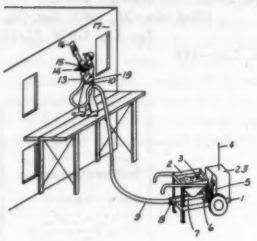
(c) a flexible hose having one end connected to the other end of said handle;

(d) a hopper with a hole therethrough at its bottom;

(e) a pump drawing cementitious material through said hole in said hopper and supplying said material to said hose;

(f) a rotating power source;

(g) a clutch releasably connecting said power source to said pump; and



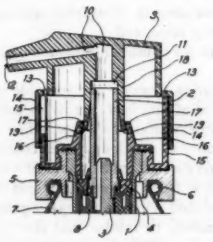
(h) a switch affixed to said handle controlling engagement of said clutch.

4,511,064

VALVE AND CAP ASSEMBLY FOR DISPENSING FLUID MATERIALS UNDER PRESSURE WITH WARRANTY SEAL

Tomaso Ruscitti; Giovanni Albini; Roberto Torretta, and Andrea Incerti Baldi, all of Milan, Italy, assignors to S.A.R. S.p.A., Chieti, Italy

Filed Mar. 2, 1983, Ser. No. 471,348
Claims priority, application Italy, Mar. 18, 1982, 21182/82[U]
Int. Cl.³ B67B *5/00*
U.S. Cl. 222—153 **1 Claim**



1. A dispensing valve and cap assembly for fluid materials under pressure for providing an assured seal, comprising:

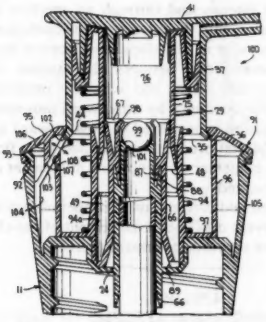
a valve having a body made of plastic material attachable onto the inlet of a container for the material to be dispensed;

a cap which includes a conduit formed therein opening at a first end thereof into a seat for accomodating a free end of a valve stem, and at a second end thereof into an outlet nozzle for material to be dispensed, said cap having integrally formed therewith a skirt and a plurality of breakable finger-like elements interconnecting said cap with said skirt and extending so as to overlap an exterior portion of said valve, wherein said valve body further comprises an inner cylindrical wall adjacent said skirt and a tubular wall defining with the valve stem a cylindrical cavity, said tubular wall having at least one inwardly projecting edge member, and wherein said seat accomodating the free end of a valve stem is defined by an extension projecting from said cap and extending within said cylindrical cavity, an outer surface of said extension having at least one outwardly projecting ridge member engaging said inwardly projecting edge member to prevent said cap from being removed from said stem.

4,511,065
MANUALLY ACTUATED PUMP HAVING PLIANT PISTON

Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045

Continuation-in-part of Ser. No. 121,223, Feb. 13, 1980, Pat. No. 4,402,432. This application Jun. 8, 1983, Ser. No. 502,273
Int. Cl.³ B05B 11/00
U.S. Cl. 222—153 13 Claims

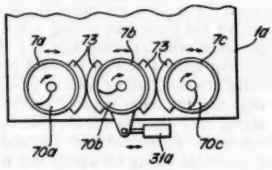


1. A pressure accumulating dispensing pump comprising, an assembly comprising a pump body and a separate piston member, said body including a closure cap for securing said assembly in fluid tight communication with the opening of a container of flowable product to be dispensed, said assembly having a container vent opening therein, and said piston sealingly engaging said body and lying along the central axis thereof, plunger means comprising an annular plunger resiliently urged into a fully raised position and mounted for reciprocation on said piston member to define therewith a variable volume pump chamber, said piston member including an inlet valve, said plunger means further comprising a plunger head slideably disposed on said plunger and having a discharge passage adapted to be opened and closed by said plunger upon changes in pressure within said chamber upon reciprocation of said head, said assembly and said plunger head having cooperating means for limiting said head at said fully raised position, said piston having an annular lip seal in sealing engagement with said plunger, said assembly further comprising a cylindrical wall spaced from and surrounding said piston member to therewith define a vent chamber which includes said vent opening, an annular vent seal on said plunger means in sealing engagement with an inner surface of said wall for closing said vent chamber while said plunger is in its raised position and during an initial downstroke reciprocation thereof, said vent seal being further adapted to open said vent chamber upon a further downstroke reciprocation of said plunger, said plunger head and said body each being of a first material having a predetermined hardness for durability and strength, and said piston and said plunger each being of a second material which is softer and more compliant than said first material, for thereby enhancing said sealing engagements between said lip seal and said plunger and between said vent seal and said wall, to positively prevent leakage of product from said chambers.

4,511,066
DEVICE USED IN CONNECTION WITH CONTAINERS FOR BULK MATERIAL

Lennart G. Forsberg, Hagagatan 24 C, S-665 00 Kil, Sweden

PCT No. PCT/SE81/00210, § 371 Date Feb. 25, 1982, § 102(e) Date Feb. 25, 1982, PCT Pub. No. WO82/00284, PCT Pub. Date Feb. 4, 1982
PCT Filed Jul. 8, 1981, Ser. No. 355,723
Claims priority, application Sweden, Jul. 21, 1980, 8005279
Int. Cl.³ B65G 33/20
U.S. Cl. 222—189 2 Claims

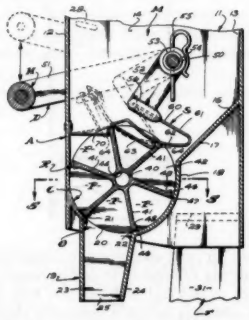


1. In a device in a container for bulk material for chipped wood, pellets and similar material, said container including a main part with mainly rectangular walls, and a feed-out part for securing an even flow of material from the container, the improvement comprising a plurality of tubes arranged in parallel side by side relation in the main part of the container, said tubes having a number of openings distributed over their surfaces for permitting the passing through of bulk material, said tubes being arranged to carry the passing through of bulk material, means to provide reciprocating movements to said tubes in the container with the upper part of said tubes protruding into the main part of the container, a feeding screw arranged co-axially inside said at least one tube and means for rotating said screw within said tube.

4,511,067
PARTICULATE MATERIAL DISPENSING DEVICE

Ernest N. Martin, 287 Industrial St., San Marcus, Calif. 92069; William H. Barner, 969 Tia Juana St., Laguna Beach, Calif. 92651, and Don M. Martin, P.O. Box 814, San Marcus, Calif. 92069

Filed Aug. 30, 1983, Ser. No. 527,684
Int. Cl.³ G01F 11/24
U.S. Cl. 222—230 19 Claims



1. A particulate material dispenser comprising an elongate, vertical body with front, rear and side walls, a bottom wall and defining an upwardly opening material holding compartment, an elongate, laterally extending semicylindrical chamber at the bottom wall and opening upwardly into the compartment, an elongate, laterally extending vertical discharge opening with front, rear and end edges at the bottom of said chamber, an

elongate rotor with a plurality of circumferentially spaced, longitudinally extending, radially outwardly projecting webs with outside edges and defining a plurality of circumferentially spaced radially outwardly opening material receiving and transporting pockets of predetermined volume, said rotor is positioned in and extends longitudinally of the chamber with the outside edges of two adjacent webs at the lower half of the rotor in sliding sealing engagement with the inside surface of the chamber adjacent the front and rear edges of the opening and with the pocket therebetween communicating with said opening, spring means normally yieldingly urging the rotor down in the chamber and intermittently operable to rotate the rotor to sequentially advance the pockets into and out of communication with the opening and including an elongate spring positioned above the rotor and having a lower rear end in driving engagement with a trailing side of a substantially upwardly projecting leading web, a forward portion engaging the outside edge of a next trailing web, an intermediate portion releasably engaging the outer edge of said leading web and yieldingly urging the rotor down in the chamber and an upper portion, drive means connected with the upper portion and operating to move the spring forwardly and to move its rear end from engagement with said leading web into engagement with said trailing web and to move the spring rearwardly and drive said trailing web rearwardly and rotate the rotor to move the pocket rearward of and adjacent the pocket communicating with said opening into communication with said opening.

4,511,068

DISPENSER FOR PASTE-LIKE PRODUCTS

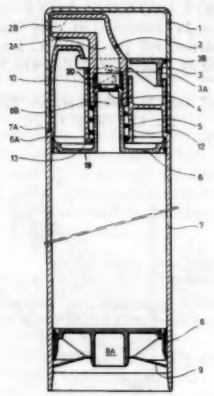
Jaap Bossina, Bussum, Netherlands, assignor to Gap Gesselschaft fuer Auswertungen und Patente AG, Glarus, Switzerland

Filed Jan. 7, 1983, Ser. No. 456,449

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1982, 3201356; Jun. 22, 1982, 3223267

Int. Cl.³ G01F *11/00*

U.S. Cl. 222—257 **8 Claims**



6. A dispenser for paste-like products comprising a container for holding a supply of product to be dispensed, said container having a lower cylindrical wall portion that is closed by a closure piston which is slideable upwardly therein and is displaced upwardly by atmospheric pressure as product is dispensed from the container, and repetitively actuatable delivery means at an upper portion of the container whereby a limited amount of product can be dispensed at each actuation, said dispenser being characterized by:

A. said delivery means comprising

(1) a delivery piston

(a) which has a peripheral portion that axially slidably and sealingly engages an upper cylindrical wall portion of the container all around the same and

(b) which substantially closes said upper wall portion of the container, opposes said closure piston and cooperates with it in defining the interior of the container so that downward movement of the delivery piston decreases the volume of said interior,

(2) an upwardly projecting dispensing portion on the delivery piston,

(a) the exterior of which comprises means whereby the delivery piston can be manually displaced downward and

(b) which has an outlet at its top that is communicable through its interior and through an aperture in the delivery piston with the interior of the container, and

(3) a non-return valve in said dispensing portion for controlling communication between the interior of the container and said outlet and whereby product displaced from the container by downward movement of the delivery piston is permitted to flow upward to said outlet but displaced product is prevented from flowing back into the container upon upward movement of the delivery piston; and

B. locking means on said closure piston cooperating with the container to prevent downward movement of the closure piston but permit upward movement thereof.

4,511,069

DISPENSING SYSTEM

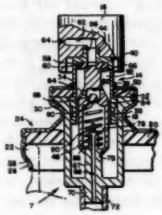
Edwin F. Kalat, Thomaston, Conn., assignor to The Pharmasol Corporation, Randolph, Mass.

PCT No. PCT/US82/00748, § 371 Date Jan. 17, 1983, § 102(e) Date Jan. 17, 1983, PCT Pub. No. WO82/04203, PCT Pub. Date Dec. 9, 1982

Continuation-in-part of Ser. No. 270,554, Jun. 4, 1981, abandoned. This PCT application Jun. 2, 1982, Ser. No. 465,689

Int. Cl.³ B05B *9/04*; B65D *83/14*

U.S. Cl. 222—263 **11 Claims**



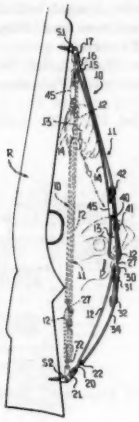
1. A pump especially adapted to be mounted in and on an hermetically sealed container and to remove and discharge fluid contained therein at an elevated discharge pressure, said pump having a discharge chamber, an intake chamber and a reciprocating valve body characterized in that the said intake chamber is mounted on said valve body and is contained entirely within said discharge chamber, said valve body is spring loaded, said discharge chamber comprises a housing having an open end and a closed end mounted on said container, a cooperating piston having an open ended bottom mounted in the open end of said housing, said spring loaded valve body is positioned between said housing and said piston, an upstanding stem is provided in the closed end of said housing and the lower end of said valve body comprises an open ended chamber forming said intake chamber and is mounted on said stem in sliding but sealed relation thereto, whereby said pump is pressure actuated and said discharge pressure is substantially independent of the pressure within said hermetically sealed container.

4,511,070

ADJUSTABLE SLING FOR RIFLES, SHOTGUNS OR THE LIKE

Floyd Hightower, 5617 Lake Highlands Dr., Waco, Tex. 76710

Filed Jul. 13, 1983, Ser. No. 513,310
Int. Cl.³ F41C *27/00*
U.S. Cl. 224—150 **12 Claims**



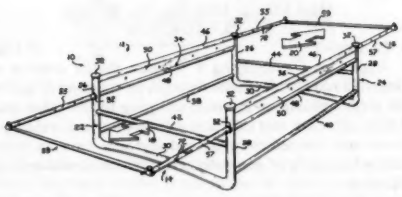
1. A sling for a rifle, shotgun or the like comprising an elongated web of material folded upon itself to define axially opposite first and second overfolded end portions, a separate loop disposed between said overfolded end portions, means for connecting said separate loop to a first end of said web immediately adjacent said first overfolded end portion, said web including first second and third web portions disposed at least partially in superposed adjacent relatively sliding relationship, said first web portion passing through said separate loop and forming an integral extension between said opposite overfolded end portions, said second web portion being sandwiched between said first and third web portions, said second and third web portions collectively defining a third overfolded end portion passing through and partially entraining said separate loop, and said first web portion being in sandwiched relationship to said third overfolded end portion and said web first end whereby said first web portion can be slid through said separate loop in either of two opposite directions to selectively lengthen or shorten the distance between said connecting means and thereby effectively lengthen or shorten said sling.

4,511,071

COMBINATION BACKPACK FRAME AND COT

Richard F. Curran, 1956 W. Bradley Pl., Chicago, Ill. 60613

Filed Nov. 28, 1983, Ser. No. 555,566
Int. Cl.³ A45F *4/06*
U.S. Cl. 224—156 **5 Claims**



1. A combination backpack and cot comprising:

a main frame assembly including a first U shaped end member having a pair of upwardly extending leg portions and a connection portion, a second U shaped member having a pair of upwardly extending leg portions and a connection portion, a first pair of connecting tubes attached between a first leg portion of said first U shaped member and a first leg portion of said second U shaped member, and a second pair of connecting tubes attached between a second leg portion of said first U shaped member and a second leg portion of said second U shaped member;

a substantially rectangular main frame web having a pair of opposing longer sides and a pair of opposing shorter sides, said main frame web being supported on a first longer side by said first pair of connecting tubes, and supported on a second longer side by said second pair of connecting tubes, said first shorther side terminating proximate said first U shaped member of said main frame assembly, and said second shorter side terminating proximate said second U shaped member of said main frame assembly, said main frame web being provided with at least two elongated slots parallel to said pair of shorter sides;

first U shaped extension frame assembly having a pair of leg portions and a connecting portion, where a first leg portion of said first U shaped extension frame assembly is engagable with a first tube of said first pair of connecting tubes, and where a second leg portion of said first U shaped extension frame assembly is engagable with a first tube of said second pair of connecting tubes, such that said first U shaped extension frame may slide in and out of said main frame assembly between a retracted position and an extended, cantilever position;

first locking means for selectively affixing said first U shaped extension frame to said main frame assembly;

a second U shaped extension frame assembly having a pair of leg portions coupled together by a connecting portion, where a first leg portion of said second U shaped extension frame assembly is engagable with a second tube of said first pair of connecting tubes, and where a second leg portion of said second U shaped extension frame assembly is engagable with a second tube of said second pair of connecting tubes, such that said second U shaped extension frame may slide in and out of said main frame assembly between a retracted position and an extended, cantilever position;

second locking means for selectively affixing said second U shaped extension frame to said main frame assembly;

an elongated extension frame web engaging said two elongated slots of said main frame web, a first end of said extension frame web being supported by said connecting portion of said first U shaped extension frame, and a second end of said extension frame web being supported by said connecting portion of said second U shaped extension frame; and

tensioning means for providing tension to said extension frame web.

4,511,072

DRINKING CUP HOLDER FOR AUTOMOBILES

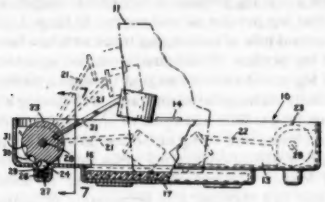
Burgess Owens, 35 Northcote Dr., Dix Hills, N.Y. 11747

Filed Jun. 22, 1984, Ser. No. 623,496
Int. Cl.³ A47B *37/00*; B65D *25/22*
U.S. Cl. 224—273 **9 Claims**

1. A cup holder for use in an automobile and characterized in combination by the following:

a pair of trays connected each to the other and foldable between a spread operable mode and a closed mode wherein the trays are adjacent each other for storage;

mounting means for connecting at least one of the trays to a support surface of the automobile convenient to a user; each of the trays adapted to seat a cup therein;



each of the trays provided with a pair of oppositely disposed arms for engaging a cup.

4,511,073

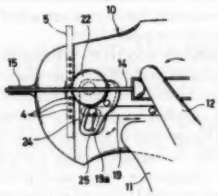
FASTENER DISPENSING DEVICE

Akira Furutsu, Tokyo, Japan, assignor to Japan Bano'k Co., Ltd., Tokyo, Japan and Ben Clements & Sons, Inc., South Hackensack, N.J.

Filed Jul. 23, 1982, Ser. No. 401,181

Int. Cl.³ B25C *1/00*

U.S. Cl. 227—67 **7 Claims**



1. A device for dispensing a plurality of fasteners one at a time for each operation of the device, each said fastener including a filament having a head at one end thereof and a crossbar integrally formed at the other end thereof and also having a connection neck protruding beyond said crossbar away from said head, said fasteners being connected through said connection necks respectively thereof on a carrier bar to form an integral fastener assembly, comprising a main body having a front end including a side-slotted hollow needle removably mounted at said front end and a guide groove formed at the tail end of said hollow needle for receiving and guiding said fasteners loaded in the device, said guide groove extending substantially perpendicular to said hollow needle, an operation lever pivotably coupled to said main body, a pushing rod to be driven into the hollow needle through operation of said operation lever to dispense fasteners through the needle relative to objects in a manner such that the pushing rod drives the crossbar of the fastener through the hollow needle and through an object, and a fastener feeding mechanism for delivering fasteners of a fastener assembly loaded in the device successively one at a time for each operation of the operation lever to a prescribed discharge position within said main body in alignment with said hollow needle, said fastener feeding mechanism including a friction wheel with a smooth peripheral face having a high coefficient of friction rotatably supported on said main body adjacent said guide groove and abutting against said connection necks of said fasteners but not extending therebetween, a support plate mounted coaxially with said friction wheel and adapted to pivot when said operation lever is pivoted, and a wheel driving member pivotably supported on said support plate having a projecting portion which selectively engages said friction wheel, said projecting portion engaging and rotating said friction wheel when said operation lever is pivoted to cause said friction wheel to move said fastener assembly by friction so that the next fastener is moved to said prescribed discharge position to be pushed through said hollow needle.

4,511,074

ELECTRICALLY-OPERATED MANUAL DEVICE

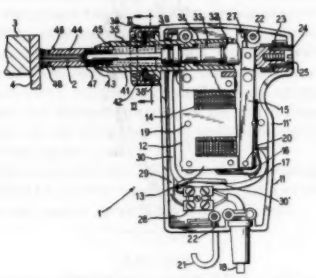
Ewald Kille, and Heinrich Griebel, both of Friedrichshafen, Fed. Rep. of Germany, assignors to J. Wagner GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,661

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125860

Int. Cl.³ B25C *1/06*

U.S. Cl. 227—113 **24 Claims**



1. A vibratory impact driving device comprising:

support means including a front and a rear;

a forwardly extending rearwardly biased, impact body supported by said support means;

element holding means supported by said support means for holding an element to be driven;

means defining at least one groove in said element holding means;

a rotatably mounted ring on said support means;

at least one clamping device within said ring;

a spring within said ring and connected to said clamping device and urging the same away from said groove;

at least one cam surface on said ring for camming said clamping device into said groove upon rotation of said ring;

a pivotally mounted member including a free end adjacent said impact body; and

drive means supported by said support means and operable to vibrate said member against said impact body and cause the same to repetitively strike the element to be driven.

4,511,075

WELDING NUCLEAR REACTOR FUEL ROD END PLUGS

Denis Yeo, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 1, 1983, Ser. No. 471,114

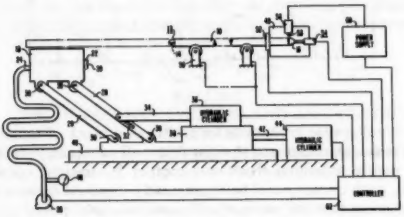
Int. Cl.³ B23K *9/00*

U.S. Cl. 228—7 **15 Claims**

1. Apparatus for applying a vacuum to the interior of a nuclear fuel rod cladding tube through an open end of said tube while girth welding an inserted end plug to the other end of said tube, all when said tube is in position for said welding and wherein said inserted end plug and said tube have an exposed common boundary of generally circular shape, said apparatus comprising:

(a) an airtight housing, said housing having a generally circular orifice with a seal hermetically engageable with said open end of said tube;

(b) a vacuum hose having one end connected to said housing;
(c) a vacuum pump connected to the other end of said hose;
(d) means for measuring the vacuum within the interior of said welding-positioned tube when said seal of said coaxially aligned orifice is hermetically engaged with said welding-positioned tube;
(e) mechanized means for disposing said housing between a first site hermetically engaging said seal of said orifice with said open end of said welding-positioned tube and a second site disengaging said seal of said orifice from said open end of said welding-positioned tube;
(f) means for transporting said tube, with said inserted end plug, to and from said welding position;



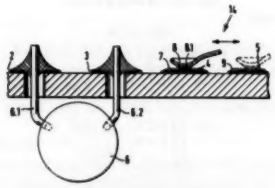
(g) means for sensing when said tube is in said welding position;
(h) means for rotating said welding-positioned tube about its longitudinal axis;
(i) a welding machine having a welding tip disposed proximate said exposed common boundary of said inserted end plug and said welding-positioned tube, and said welding machine also having a power supply; and
(j) means for monitoring said vacuum measuring means and said tube sensing means and for controlling said housing disposing means, said vacuum pump, said tube transporting means, said tube rotating means, and said welding power supply, all in a predetermined manner.

4,511,076

METHOD OF SOLDERING CIRCUIT BOARDS WITH SOLDER-REPELLENT CONTACTS

Johann Roth, Schwabhausen, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

PCT No. PCT/DE82/00082, § 371 Date Dec. 6, 1982, § 102(e) Date Dec. 6, 1982, PCT Pub. No. WO82/03723, PCT Pub. Date Oct. 28, 1982
Continuation of Ser. No. 448,916, Dec. 6, 1982, abandoned. This PCT application Apr. 8, 1982, Ser. No. 613,749
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114607
Int. Cl.³ H05K *3/34*
U.S. Cl. 228—180.1 **4 Claims**



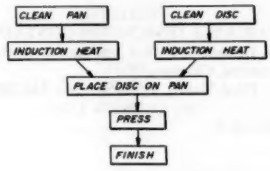
1. A method for the manufacture of a printed circuit board having electrical components mounted thereupon by being mechanically soldered to lands adjacent through holes provided in said printed circuit board, said lands being electrically interconnected to conductive tracks, said printed circuit board also being provided on a designated surface thereof with at least a first electrically exposed and corrosion-resistant contact surface for controlling the operation of said printed circuit board, said method of manufacture comprising the steps of:
(a) applying a solder-repellant but electrically conductive, corrosion-resistant and self-lubricating coating to said at least one contact surface;
(b) inserting said electrical components into said lands, and
(c) thereafter, exposing said designated surface and said solder-repellant coating to solder to mechanically and electrically connect said electrical components to said lands.

4,511,077

COOKWARE AND METHOD OF MAKING THE SAME

Al S. Rummelsburg, Scarsdale, N.Y., assignor to Kidde Consumer Durables Corp., Bronx, N.Y.

Filed Jul. 30, 1982, Ser. No. 403,828
Int. Cl.³ B23K *20/02*
U.S. Cl. 228—228 **13 Claims**



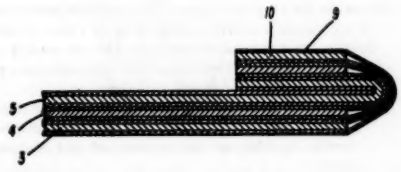
1. A method of making cookware comprising the steps of cleaning one surface of a preshaped stainless steel utensil having a bottom wall and an aluminum disk, separately heating said utensil bottom wall and disk in a manner which avoids hot spots until the temperature of the utensil is between 800°-1200° F. and the temperature of the disk is between 500°-750° F., positioning the heated disk with its cleaned surface overlying the cleaned bottom wall surface of said utensil and in direct contact therewith, and immediately thereafter bonding said surfaces directly together by applying pressure to the heated disk and utensil bottom wall.

4,511,078

PACKING CONTAINER WITH A CRACK-RESISTANT LAMINATE

Jan A. I. Rausér, Lomma, and Renato Cetrelli, Lund, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Division of Ser. No. 923,103, Jul. 10, 1978,. This application Jan. 20, 1983, Ser. No. 459,682
Claims priority, application Sweden, Jul. 11, 1977, 7708027
Int. Cl.³ B65D *5/42*
U.S. Cl. 229—17 R **5 Claims**



1. A packing container formed from a packing laminate of the type having a carrier layer and at least an outer layer laminated to each side surface of the carrier layer, the container including a wall portion having two portions of said

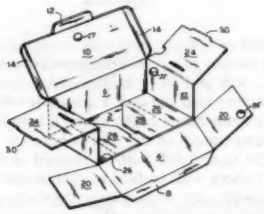
laminate joined together to form a sealing fin, a first fold line along which the sealing fin is folded down against one of said portions of said laminate, a second fold line extending transversely across said first fold line, said sealing fin being folded against itself along the second fold line, an opening being provided in a portion of the carrier layer at a predetermined location only in the carrier layer of one of the portions of said laminate, said location coinciding with and including an area completely encompassing the point where said first and second fold lines intersect, said opening being provided before said carrier layer and said outer layers are laminated, and subsequently joining said laminate to form the sealing fin, folding along said first fold line and folding along said second fold line.

4,511,079

VARIABLE DIMENSION CONTAINER

Louis Lopez, Leominster, Mass., assignor to Container Corporation of America, Chicago, Ill.

Filed Nov. 3, 1983, Ser. No. 548,238
Int. Cl.³ B65D 5/22
U.S. Cl. 229—34 R **3 Claims**



1. A self-contained, variable inner dimension, collapsible container formed from a unitary blank of foldable sheet material, such as paperboard, comprising:

(a) a bottom wall panel;

(b) front and rear side wall panels foldably joined to and upstanding from front and rear side edges of said bottom wall panel;

(c) a pair of opposed end walls each including:

(i) an intermediate panel foldably joined to an end edge of one of said side wall panels;

(ii) an outer panel foldably joined to an end edge of the other of said side wall panels;

(iii) an inner panel foldably joined to an upper edge of said outer panel;

(d) means for varying an inner dimension of said container, to accomodate alternate packaging of items of different lengths, said means including a pair of anchor panels extending inwardly from respective end wall outer panels;

(e) each of said anchor panels including:

(i) a first panel section foldably joined at its outer edge to a lower edge of a related end wall and disposed to overlie an adjacent end portion of said bottom wall panel;

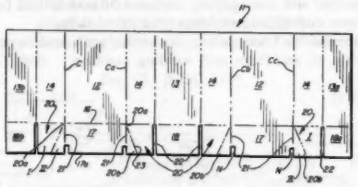
(ii) a second panel section foldably joined at its outer edge to an adjacent inner edge of said first panel section and adapted alternately to either overlie said bottom wall panel or be folded upwardly and outwardly to extend over said first section to said related end wall inner panel to shorten an inner dimension of said container.

4,511,080

INTERLOCKING END CLOSURE FLAPS ON COLLAPSIBLE EIGHT-SIDED RECEPTACLE

Roger E. Madsen, Council Bluffs, Iowa, and Michael M. Williams, Arlington, Tex., assignors to Packaging Corporation of America, Evanston, Ill.

Filed Oct. 17, 1983, Ser. No. 542,351
Int. Cl.³ B65D 5/08
U.S. Cl. 229—41 C **8 Claims**



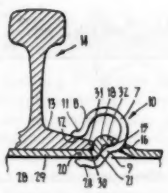
1. A collapsible receptacle formed from a blank of foldable sheet material, comprisng upright first wall panels and second wall panels separated from one another by upright corner panels, each corner panel being angularly disposed relative to the adjacent first and second wall panels and interposed same and being foldably connected thereto, said corner and wall panels delimiting a predetermined area; and bottom-forming first, second, and third flaps foldably connected, respectively, to bottom edges of said first and second wall panels and said corner panels, each third flap having one side edge thereof connected by a first foldline to an adjacent side edge of one of said first flaps, an opposite side edge of each third flap being separated from the adjacent second flap by an elongated slot, the outer end of said first foldline terminating in a notch, each third flap being provided with an outwardly angularly extending second foldline forming said third flaps into contiguous major and minor portions; when forming the receptacle bottom, said first and third flaps being first folded as a unit into the predetermined area whereby the major and minor portions of each third flap are folded relative to one another into face to face relation with the minor portion being sandwiched between the major portion and an adjacent side edge portion of said first flap and then the second flaps being folded into the predetermined area whereby said edge portions of said second flaps extend through and interlockingly engage corresponding notches and are sandwiched between corresponding side edge portions of said first flaps and the minor portions of said third flaps.

4,511,081

RAIL ANCHORING CLIP AND ASSOCIATED SLEEPER

Peter K. Wilson, Croydon, Australia, assignor to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Filed Jan. 20, 1983, Ser. No. 459,659
Claims priority, application Australia, Jan. 21, 1982, PF2385
Int. Cl.³ A44B 21/00
U.S. Cl. 238—59 **22 Claims**



1. A rail and sleeper assembly comprising a sleeper, a rail, and a rail anchoring clip for anchoring said rail on said sleeper, said rail having a vertical axis and a foot having an upper

surface, said sleeper comprising a longitudinally extending member which is substantially U-shaped in lateral cross-section with downwardly disposed sides extending from a bearing surface portion, said bearing surface portion having an upper face and a lower face, said upper face including a pair of longitudinally spaced apart stop means thereon for restraining lateral movement of said rail on said sleeper, a pair of apertures each positioned on said sleeper at a position such that said stop means is between a respective aperture and said rail, said aperture being proximate to said stop means, said clip being of resilient material and in substantially U-shape having a first leg and a second leg joined by a bridging portion, said clip extending through said aperture in the sleeper and having an end of one leg abutting tightly against the upper surface of the rail foot and having the end of the other leg abutting tightly against the lower face of said bearing surface portion to compressibly anchor the rail on to the sleeper.

4,511,082

FUEL-INJECTION SYSTEMS AND ASSOCIATED METHODS

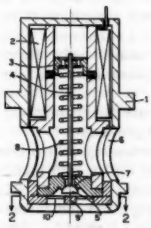
Rainer Ballik, Moers, and Heinrich Hütten, Kaarst, both of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co., KG, Neuss, Fed. Rep. of Germany

Filed Jul. 18, 1983, Ser. No. 514,962

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228323

Int. Cl.³ B05B *15/06*

U.S. Cl. 239—8 **9 Claims**



1. A fuel-injection valve for injecting liquid fuel into the induction pipe of an internal combustion engine, comprising an electromagnetically actuated armature, a stem attached to said armature for movement therewith, a valve head on said stem, a valve seat on which said valve head is seated in closed position in which fuel flow is blocked, the arrangement of said valve head and seat being such that the valve is opened by lifting the valve head off its seat in the direction of flow of the fuel, and a mechanical stop situated downstream of the valve seat for engaging the valve head in its open position to limit the stroke of the valve head.

4,511,083

SELF-REGULATING HYDRANT

Otto Muller-Girard, Rochester, N.Y., assignor to Ratnik Industries, Inc., Victor, N.Y.

Filed May 16, 1983, Ser. No. 494,968

Int. Cl.³ F25C *3/04*

U.S. Cl. 239—14 **12 Claims**

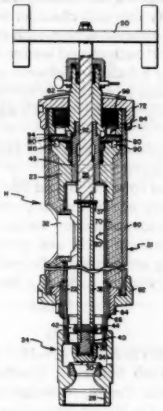
1. Self-adjusting hydrant for automatically varying the flow of a fluid in response to changes in ambient air temperature, said hydrant comprising:

(a) a first housing including means defining (i) a valve seat through which a fluid can enter said housing and (ii) an outlet through which a fluid within said housing can exit therefrom;

(b) a plug adapted to cooperate with the said valve seat for controlling the flow of fluid into said housing through said seat;

(c) means for adjusting the position of said plug relative to said seat to provide an initial predetermined flow of fluid into said housing;

(d) a second housing substantially surrounding said first housing, said second housing being adapted to change in



at least one dimension in response to changes in ambient air temperature; and

(e) linking means operatively coupling said second housing and said plug for varying the position of said plug relative to said valve seat in response to dimensional changes in said second housing as occasioned by changes in ambient air temperature.

4,511,084

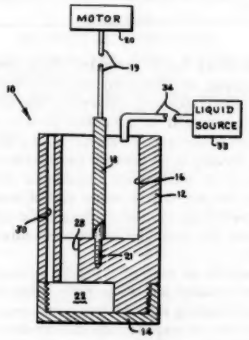
TOP FEEDING LIQUID ATOMIZER

Vann Y. Won, 6697 Gloria Dr., Sacramento, Calif. 95831

Filed May 12, 1983, Ser. No. 493,885

Int. Cl.³ B05B *3/02*

U.S. Cl. 239—223 **7 Claims**



1. A top feeding liquid atomizer comprising:

an elongated body, said body having a top first end and closed second end;

a cutout portion situated adjacent said first end of said body, said cutout portion having an open top;

a chamber situated adjacent said second end of said body, said chamber having a plurality of spaced apart, radially extending, wedge-shaped ribs therein, with the spaces

between adjacent pairs of said wedge-shaped ribs defining a plurality of radially extending flow channels, respectively;

means within said body for interconnecting said cutout portion with said chamber;

a plurality of longitudinally extending, elongated passageways formed in said body and having openings positioned adjacent the periphery of the top of said first end of said body, said passageways extending from the top of said first end of said body into said chamber such that each of said passageways is situated within each of said flow channels, respectively, and each of said wedge-shaped ribs intercept said chamber at a location between adjacent pairs of said passageways, said passageways having their longitudinal axes substantially parallel to the longitudinal axis of said body; and

means operably connected to said body for rotating said body at a preselected speed;

whereby continual rotation of said body, while liquid is fed into said open top of said cutout portion forces said liquid through said interconnecting means into said chamber, through said flow channels, and up said passageways into the surrounding atmosphere adjacent the top of said first end of said body in the form of a fine globular spray.

4,511,085

SWIVEL DRIVE FOR FAN-JET SPRINKLER

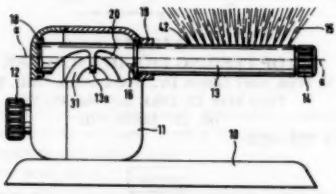
Friedrich Schanz; Emil Schucker; Eberhard Schucker, all of Calw, and Alexander Perrot, Althengstett, all of Fed. Rep. of Germany, assignors to Perrot-Regnerbau GmbH & Co., Calw, Fed. Rep. of Germany

Filed Apr. 8, 1982, Ser. No. 366,678

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114095

Int. Cl.³ B05B *3/16*

U.S. Cl. 239—242 **9 Claims**



1. In a swiveling fan-jet sprinkler which comprises a closed sprinkler housing, an elongated nozzle cylinder journalled in the housing and extending outwardly therefrom, a series of nozzle bores arranged in a fan-tail pattern on the exposed length portion of the nozzle cylinder, and a hose connector on the housing serving as an inlet for pressurized water, in such a sprinkler, a drive mechanism capable of deriving a rotary motion from the pressurized water and of translating this motion into a swiveling motion of the nozzle cylinder about its rotational axis, the sprinkler drive mechanism comprising in combination:

an inlet nozzle as part of the hose connector adapted to produce a water jet, when pressurized water enters the sprinkler housing through the hose connector;

a turbine wheel arranged inside the sprinkler housing in such a way that the water jet causes the turbine wheel to rotate;

a reduction gear drive arranged inside the sprinkler housing, said drive having its input side connected to the turbine wheel and including, on its output side, a final drive shaft with an axis which is arranged at a distance from and substantially perpendicular to the axis of the nozzle cylinder and to an axial plane through the nozzle cylinder;

a rotary cam member mounted on the final drive shaft so as to rotate therewith, the cam member being so arranged that a median position thereof is in substantial alignment with said axial plane through the nozzle cylinder axis; and

a cam follower connected to the nozzle cylinder and cooperating with the cam member in such a way that the rotary motion of the cam member is translated into a reciprocating swiveling motion of the nozzle cylinder.

4,511,086

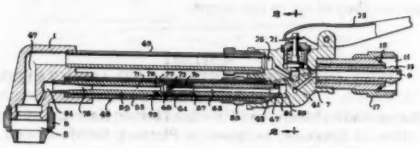
CUTTING TORCH

Chuan M. Kuo, 2nd Fl., No. 10, Lane 222, Tung Hwa, N. Rd., Taipei, Taiwan

Continuation-in-part of Ser. No. 395,164, Jul. 6, 1982,. This application Oct. 1, 1982, Ser. No. 432,169

Int. Cl.³ B05B *7/12*

U.S. Cl. 239—416.3 **24 Claims**



1. A cutting torch comprising:

a cutting head for receiving a removable cutting tip;

a valve body having an oxygen inlet, a fuel inlet, a cutting oxygen outlet, a preheat oxygen outlet, and a preheat fuel outlet communicating with said fuel inlet;

a cutting oxygen control valve for controlling the flow of oxygen from said oxygen inlet to said cutting oxygen outlet;

a preheat oxygen control valve for controlling the flow of oxygen from said oxygen inlet to said preheat oxygen outlet;

a cutting oxygen tube connecting said cutting oxygen outlet to said cutting head; and

a preheat tube connecting said preheat oxygen outlet and said preheat fuel outlet with said cutting head, said preheat tube including:

an outer tube having a first end connected to said valve body and a second end connected to said cutting head;

an inner tube the majority of which is within said outer tube and having a first end extending beyond the first end of said outer tube and a second end within said outer tube;

a nozzle fitting having a first end sealing connected to said second end of said inner tube;

a mixer tube having a first end sealingly connected to a second end of said nozzle fitting, said mixer tube having a second end sealingly connected to said cutting head,

the outer surfaces of said inner tube and said mixer tube and the inner surface of said outer tube defining a fuel channel communicating with said preheat fuel outlet; and

sealing means adjacent the first end of said inner tube for isolating said fuel channel from said preheat oxygen outlet,

said inner tube and said nozzle fitting including a central bore defining an oxygen channel communicating with said preheat oxygen outlet, said nozzle fitting having a nozzle of smaller diameter than to said oxygen bore, said nozzle being disposed at the second end of said fitting;

said second end of said nozzle fitting and said first end of said mixer tube defining a chamber of larger diameter than said oxygen channel,

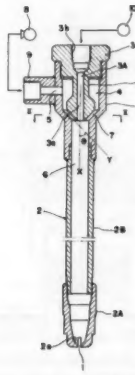
said mixer tube including a central bore defining a mixing channel communicating with said chamber and said cutting head,

said mixer tube also including a plurality of transverse passageways communicating with said fuel channel and said mixing channel at a point adjacent to but spaced from said chamber.

4,511,087
AIR MIST NOZZLE APPARATUS

Kozo Matsumoto, Nishinomiya, Japan, assignor to Kyoritsu Gokin Mfg. Co., Ltd., Hyogo, Japan

Filed Apr. 4, 1983, Ser. No. 482,034
Claims priority, application Japan, Apr. 8, 1982, 57-51500[U]
Int. Cl.³ B05B 7/06
U.S. Cl. 239—433 4 Claims

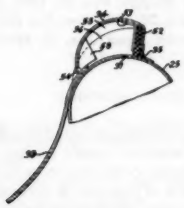


1. A nozzle apparatus for atomizing a liquid, said apparatus consisting of a jet pipe having a nozzle tip at one end thereof, a casing connected to the other end of said jet pipe, a liquid supply connector directly mounted in a sidewall of said casing and having a liquid supply port provided therethrough, and a nozzle member having a gas jet passage for injecting pressurized gas into a reduced diameter portion of said casing, wherein a recessed portion of said nozzle member and an enlarged diameter portion of said casing define a chamber for receiving a liquid in communication with said liquid supply port, and wherein a constricted middle portion of said casing defines a liquid outflow passage means around said nozzle in communication with said liquid receiving chamber, said liquid outflow passage means having liquid outflow directions crossing at a predetermined angle in relation to the flow of pressurized gas jetted out of said jet passage of said nozzle member into said reduced diameter casing portion.

4,511,088
LIQUID DISTRIBUTION DEVICE

Henry E. Wilt, Neptune Beach, and Larry N. Murray, Fernandina Beach, both of Fla., assignors to Fabralloy, Inc., Jacksonville, Fla.

Filed Dec. 6, 1982, Ser. No. 446,867
Int. Cl.³ B05B 1/32; D21C 9/02
U.S. Cl. 239—455 16 Claims

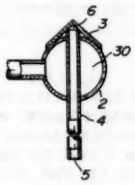


1. A liquid distribution device comprising an elongated tubular horizontal reservoir for holding liquid to be distributed, an elongated arcuate cap member extending substantially along said reservoir, a plurality of passageways through the upper wall of said reservoir and communicating with an elongated generally arcuate space substantially enclosed by said cap member for receiving liquid from said reservoir, said cap member having an elongated outlet edge which is spaced from said passageways and adjustable with respect to the outside surface of said reservoir to define an elongated substantially continuous narrow slit outlet through which the liquid flows in the form of a thin sheet substantially throughout the length of said cap member.

4,511,089
NOZZLE HEADER FOR COOLING PLATES

Sadao Ebata, and Seiji Bando, both of Kurashiki, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jun. 30, 1983, Ser. No. 509,957
Claims priority, application Japan, Jul. 7, 1982, 57-102917[U]
Int. Cl.³ B05B 1/14
U.S. Cl. 239—553.3 5 Claims



1. A nozzle header comprising a lower cylindrical header to form a lower header chamber therein and having cooling water supply means for supplying a cooling water into said lower header chamber, an upper header in the form of a roof mounted on said lower cylindrical header therealong to form an upper header chamber therein substantially triangular in section with an upper wall of said lower cylindrical header, said upper wall being formed with communicating apertures for communicating said lower and upper header chambers, and nozzles extending through said lower header chamber and having upper ends communicating with said upper header chamber and lower ends forming nozzle outlets for jetting said cooling water against a surface to be cooled.

4,511,090
MATERIAL SPREADER

Paul M. Morgan, Middletown, Ohio, assignor to Lakeshore Equipment & Supply Co., Elyria, Ohio

Filed Apr. 14, 1983, Ser. No. 485,029
Int. Cl.³ A01C 17/00
U.S. Cl. 239—666 9 Claims

1. In a spreader for particulate material adapted to be advanced in a given direction and having discharge means for discharging the particulate material downwardly from the spreader and a rotary distributor in association with the discharge means for broadcasting the discharged material out-

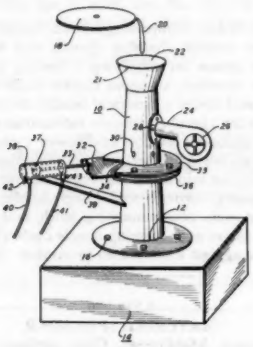
wardly of the spreader, a particulate material deflector means on one side of the spreader and movable between first and second positions, said deflector means being located radially adjacent said rotary distributor when in said first position to intercept material broadcast by said rotary distributor and being spaced from said first position so as not to intercept material broadcast by said rotary distributor when in said second position, said deflector means having a surface against which the material broadcast by said distributor impinges when said deflector means is in said first position, and said deflector means having a nose end portion for directing the intercepted material across the front of the spreader and to the side of the spreader opposite that side where the deflector is located, said surface against which the material broadcast by said rotary distributor impinges comprising a surface which is curved in a direction circumferentially of said rotary distributor.

4,511,091

METHOD AND APPARATUS FOR RECYCLING THERMOPLASTIC SCRAP

Augusto Vasco, 7 E. Beech St., Central Islip, N.Y. 11722

Filed Jan. 6, 1983, Ser. No. 456,282
Int. Cl.³ B02C *23/18*
U.S. Cl. 241—18 **18 Claims**



1. A device for immediately recycling hot thermoplastic scrap extruded out of the edges of newly formed phonograph records comprising:

a vertically oriented tubular member having a passageway and upper and lower ends said tubular member adapted to receive hot thermoplastic scrap at the upper end thereof;

platform means located between the upper and lower ends of said tubular member and drive means to move said platform means between a first position within said tubular member which blocks the passageway so that said scrap can fall onto said platform means and a second position at least partially without said tubular member so that said scrap can fall through said tubular member; said platform means being wide enough to permit the hot thermoplastic scrap to spread out and expose much of its surface area to the surrounding temperature when in said first position;

fluid circulating means located between said platform means and the upper end of said tubular member for cooling said thermoplastic scrap when said platform means is in said first position; and

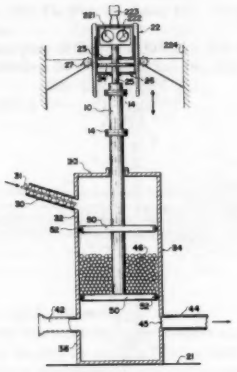
pulverizing means coupled to the lower end of said tubular member for pulverizing said cooled thermoplastic scrap.

4,511,092

MILLING APPARATUS

Henry North, R.R. #16, Thunder Bay, Ontario, Canada P7B 6B3, and William R. Fauconnier, 1759 Meryle St., Thunder Bay, Ontario, Canada (P0T 2Z0)

Filed Apr. 27, 1983, Ser. No. 489,043
Int. Cl.³ B02C *19/16*
U.S. Cl. 241—49 **9 Claims**



1. Apparatus for milling particulate material comprising a container having a peripheral wall for receiving and confining the particulate material, means for maintaining said container stationary, a planar plate mounted within the peripheral wall of the container and having a periphery substantially coextensive therewith for movement relative thereto in a direction longitudinally of the container and transversely to an original plane of the plate, the container including an inlet arranged on one side of the plate and an outlet arranged on an opposed side of the plate, a plurality of grinding elements within the container on at least one side of the plate and arranged to be confined thereby to said one side, an oscillator including an eccentric member and means for rotating the eccentric member to provide oscillatory movement at a frequency, and means for communicating oscillation from said oscillator to the plate to oscillate the plate relative to the container in said direction to agitate the grinding elements, said communicating means being arranged such that its natural frequency of vibration is tuned to the frequency of the oscillator so that the frequency of oscillation of the oscillator is substantially the same as the natural frequency of vibration of said communicating means.

4,511,093

MIXER-GRANULATOR DRIER

Tatsuo Ohkoshi, and Chikara Kobayashi, both of Tokyo, Japan, assignors to Nara Machinery Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 347,669, Feb. 10, 1982, abandoned.
This application Apr. 24, 1984, Ser. No. 603,468
Claims priority, application Japan, Jun. 23, 1981, 56-97004
Int. Cl.³ B02C *23/20*
U.S. Cl. 241—60 **5 Claims**

1. A mixer-granulator drier, comprising:

a vessel;

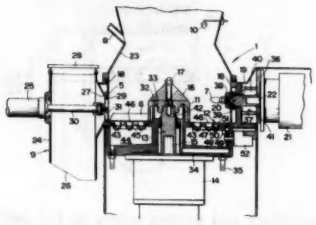
a mixing-granulating mechanism mounted in said vessel and including main and auxiliary rotary mixing granulating blades which are caused to revolve so as to accomplish mixing and granulation of powders as desired;

said main rotary mixing granulating blades being provided at a bottom of said vessel and said auxiliary rotary mixing granulating blades being provided at an internal lateral surface of said vessel just above a proximity of ends of said main rotary mixing granulating blades;

a valve means for opening and closing a number of slots

formed in a bottom plate of said vessel, said valve means including movable pieces adapted to open and close said slots, and means for raising and lowering said movable pieces so that said valve means may be closed during mixing-granulating;

said valve means includes each of said slots having a constriction at a top thereof and movable pieces of contour adapted to fit fluid-tightly in respective constrictions of said slots;



said means for raising and lowering said movable pieces includes a movable disk located opposite an under surface of said bottom plate, said movable disk carrying said movable pieces fixedly thereon, and further includes means for raising and lowering said movable disk; and

means for supplying drying-air into said vessel through said slots when said valve means is open.

4,511,094

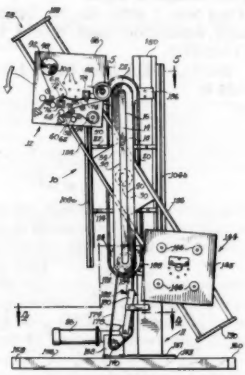
WINDING APPARATUS

Henry R. Kent, San Diego, Calif., assignor to Maxwell Laboratories, Inc., San Diego, Calif.

Filed Nov. 22, 1982, Ser. No. 443,292

Int. Cl.³ H01F *41/08, 41/12*

U.S. Cl. 242—7.08 **4 Claims**



1. Winding apparatus for depositing successive layers of ribbon upon a mandrel to form a winding, comprising:

frame means,

a mandrel supported by said frame means and having a peripheral support surface,

a ribbon dispensing assembly,

drive means operatively associated with said frame means and said dispensing assembly to transport said dispensing assembly through a predetermined path about the periphery of said mandrel, and

a counterbalanced rotating track which engages said dispensing assembly as it travels through said predetermined path,

said dispensing assembly depositing successive layers of ribbon on said peripheral support surface as it travels through said predetermined path,

said dispensing assembly including means for applying transverse pressure to an outer exposed surface of the winding as each successive layer of ribbon is applied thereto.

4,511,095

METHOD AND APPARATUS FOR WINDING GLASS FIBERS

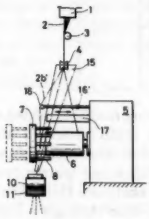
Eizo Ideno; Shinichi Fukushi; Masahiko Tai, all of Kyoto; Koji Nakazawa, and Toshihito Fujita, both of Fukushima, all of Japan, assignors to Shimadzu Corporation and Nitto Boseki Co., Ltd., both of, Japan

Filed Feb. 22, 1983, Ser. No. 468,550

Claims priority, application Japan, Feb. 27, 1982, 57-31392; Feb. 27, 1982, 57-31393; Jul. 15, 1982, 57-122148; Jul. 27, 1982, 57-129695; Aug. 7, 1982, 57-136825; Aug. 14, 1982, 57-140490

Int. Cl.³ B65H *54/02, 67/04*

U.S. Cl. 242—18 G **18 Claims**



1. A method of winding a strand of glass fiber filaments on a takeup collet, comprising the steps of:

(a) guiding an end portion of the strand being drawn off from the spinning bushing, on a stream of fluid, to a strand pulling mechanism;

(b) automatically engaging said guided strand with said strand pulling mechanism and pulling the strand therewith;

(c) automatically moving an auxiliary winding mechanism from a standby position to a winding position, and moving said pulled strand into winding engagement with said auxiliary winding mechanism and winding said strand on said auxiliary winding mechanism;

(d) automatically moving said strand from said auxiliary winding mechanism into winding engagement with an empty takeup collet and winding said strand on said takeup collet and moving said auxiliary winding mechanism back to said standby position;

(e) winding said strand on said takeup collet until a predetermined amount of said strand is wound on said takeup collet to fill said takeup collet;

(f) automatically moving said auxiliary winding mechanism from said standby position to said winding position, and moving said strand into winding engagement with said auxiliary winding mechanism and winding said strand on said auxiliary winding mechanism;

(g) automatically moving said auxiliary winding mechanism back to said standby position, while continuing to wind said strand thereon;

(h) replacing said filled takeup collet with an empty takeup collect;

(i) automatically moving said auxiliary winding mechanism from said standby position to said winding position, while continuing to wind said strand thereon;

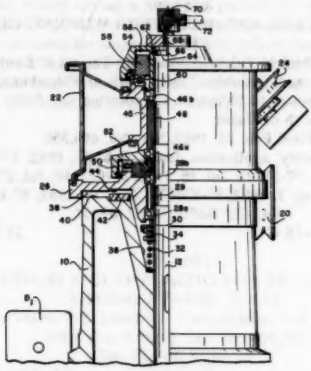
repeating steps (d)–(i) sequentially until said strand accidentally breaks and then repeating steps (a)–(i).

4,511,096

SPINNER DRIVE FOR DOUBLE BLOCK WIRE DRAWING MACHINE

Ronald W. DuFries, Westboro, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Nov. 14, 1983, Ser. No. 551,332
Int. Cl.³ B65H *51/20*; B21C *1/14*
U.S. Cl. 242—47.01 **7 Claims**



1. In a wire drawing machine having at least one station with a rotatably driven shaft on which are arranged upper and lower blocks and an associated spinner carrying a transfer sheave, the upper block and spinner being rotatable relative to each other on said shaft and the lower block being driven by said shaft to draw wire through a die, the thus drawn wire being temporarily accumulated as a plurality of windings on the driven lower block before passing via the transfer sheave to the upper block where the wire is again temporarily accumulated as a plurality of windings before leaving the station, the improvement comprising: means for mounting the spinner for axial movement on said shaft in relation to the lower block; separating means for yieldably urging the spinner axially away from the lower block to maintain a spacing therebetween; and control means acting in opposition to the separating means to axially urge the spinner into contact with the lower block, thereby causing the spinner to be frictionally driven by the lower block.

4,511,097

AUTOMOBILE SEAT BELT WINDING DEVICE

Noboru Tsuge, Kariya; Masahiro Taguchi, Okazaki, and Satosi Kuwakado, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 9, 1982, Ser. No. 448,326
Claims priority, application Japan, Dec. 14, 1981, 56-201873; Apr. 3, 1982, 57-54779; Apr. 7, 1982, 57-49425[U]; Apr. 26, 1982, 57-68757; Oct. 1, 1982, 57-173440; Oct. 21, 1982, 57-183683
Int. Cl.³ A62B *35/00*
U.S. Cl. 242—55 **15 Claims**

1. An automobile seat winding device, comprising:

a seat belt retractor, said retractor having a rotatable winding shaft for the seat belt to be wound thereonto;

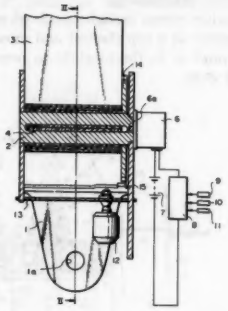
a means for driving said shaft for winding said seat belt;

a first sensor for sensing whether said seat belt is being worn or not;

a second sensor for sensing a slack in said seat belt;

a slip joint, rotatably provided around a predetermined axis, for guiding said seat belt and being pivotally provided so that it can move between a first position, in which it hangs freely from a pivot shaft means, and a second position, in which it is tapered relative to said first position due to the belt tension, and said second sensor is a switch which is operated due to the change of the angular position around said predetermined axis of said slip joint; and

a control means responsive to said first and second sensors



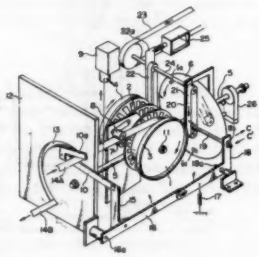
for controlling said driving means so that said driving means winds said seat belt after said seat belt is taken off and where there is a slack in said seat belt while said seat belt is being worn.

4,511,098

FILM STORAGE DEVICE

Yoshikazu Konaya, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 7, 1983, Ser. No. 549,530
Claims priority, application Japan, Nov. 8, 1982, 57-194513; Dec. 6, 1982, 57-212775
Int. Cl.³ G03B *1/58*; G03D *3/12*
U.S. Cl. 242—56 R **7 Claims**



1. A film storage device comprising: first and second rotatable reels for storing a film, a rotatable shaft, said first and second reels being coupled to said rotatable shaft and being rotatable about an axis extending perpendicular to a longitudinal axis of said rotary shaft; a rotary plate coupled to said rotary shaft and having a plane extending perpendicular to said longitudinal axis of said rotary shaft; and movable driving means, said movable driving means being selectively positionable to engage either at least one of said reels or to said rotary plate supplying driving power.

4,511,099

HUB OF A TAPE CASSETTE

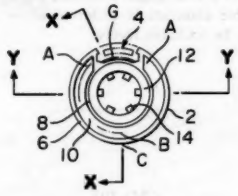
Eiichi Nunokawa, Saku; Toshihiko Ishida, Komoro, and Yasuo Ohira, Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 15, 1983, Ser. No. 552,027

Claims priority, application Japan, Nov. 30, 1982, 57-180042[U]

Int. Cl.³ B65H 75/18, 75/28

U.S. Cl. 242—71.8 2 Claims



1. A hub of a tape cassette, comprising:

a generally circular outer ring portion,

an inner ring portion concentric with the outer portion, and

a generally annular rib connecting the outer and inner ring portions,

wherein said annular rib is formed having a tapered wall with a thickness which increases gradually and continuously from a first position adjacent to a gate portion for injection molding towards a second position most furthest from the gate portion, along the circumferential direction.

4,511,100

RAILLESS VECHICLE FOR UNDERGROUND MINING

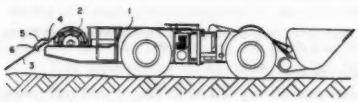
Walter G. Oetringhaus, Oberhausen, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Aktiengesellschaft, Augsburg-Nuremberg, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,606

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209294

Int. Cl.³ B60L 9/04; H02G 11/00

U.S. Cl. 242—86.51 1 Claim



1. An electrically operated railess underground vehicle which is adapted to be supplied with electrical power from a stationary energy source of electrical power, comprising:

a vehicle body (1);

a rotatable magazine drum (2) mounted on said body;

a power line (3) adapted to be connected to a power source for operating said vehicle and windable on said drum in a winding direction and in an unwinding direction;

a three phase asynchronous motor (7) mounted on said body;

a power distributor (8) mounted on said body and connected to said asynchronous motor, said distributor having at least two rotary power outputs (9d,9c) rotatable by said asynchronous motor;

a controllable hydrostatic drum drive (10) connected to one of said outputs (9d) and including a hydraulic pump (12) and a hydraulic motor (11) rotatable by said pump to rotate said drum in the winding direction and in the unwinding direction;

a torque control (13) connected to said hydrostatic drum drive for controlling a speed and a direction of rotation of said hydraulic motor;

a controllable hydrostatic vehicle travel drive connected to the other output (9c) of said distributor for causing said vehicle to travel in a selected direction;

a travel drive control (24) connected to said vehicle travel drive and to said torque control for stopping travel of the vehicle in response to a limiting signal from said torque control;

a converter (14) connected to said torque control for supplying signals to said torque control including a signal for rotating said drum in the winding direction, a signal for rotating said drum in the unwinding direction and a limitation signal for causing said torque control to generate its limiting signal to stop the travel of said vehicle;

a lever member (5) connected to said converter and engaged with said power line, said lever member being pivotable upwardly and downwardly with changes in a relative angular position between said power line and said vehicle body for causing said converter to supply signals to said torque control for winding and unwinding said drum, said lever member movable out of a selected range of upward and downward positions to cause said converter to generate said limitation signal for stopping travel of said vehicle, said lever member being movable in a selected lateral angular range, said lever member causing said converter to generate said limitation signal when said cable moves out of said lateral range to stop travel of said vehicle; and

a brake line connected to said torque control for carrying said limiting signal of said torque control for braking travel of said vehicle.

4,511,101

REELING DEVICE

William King, 79 Allison Rd., Elsternwick 3185 Victoria, Australia

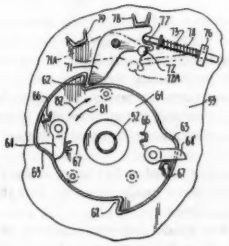
PCT No. PCT/AU81/00195, § 371 Date Aug. 31, 1982, § 102(e) Date Aug. 31, 1982, PCT Pub. No. WO82/02376, PCT Pub. Date Jul. 22, 1982

PCT Filed Dec. 31, 1982, Ser. No. 414,380

Claims priority, application Australia, Jan. 2, 1981, PE07118

Int. Cl.³ B65H 75/48

U.S. Cl. 242—107.7 5 Claims



1. A reeling device including a casing, a reel for holding, paying-out and winding-in a linearly extendible, flexible member, means for biasing said reel in a direction of rotation for winding-in said member and a latching mechanism for preventing and permitting winding-in of said member, the latching mechanism comprising

a pawl (71) mounted solely to pivot between a first position and a second position about a pivot axis fixed to the casing,

a body (61) mounted to the reel for rotation therewith, said body having a cam surface (63) which, when the reel rotates in a first part of a rotation in the pay-out direction, moves the pawl from the first position, in which it is in contact with the cam surface, to the second position, in which it is remote from the body, said body having an abutment (64, 64') which, when the reel rotates in a second

part of said rotation in the pay-out direction, moves the pawl from the second position to the first position, said abutment being pivotally mounted on said body to extend therefrom when the reel is rotated in the pay-out direction;

said cam surface and the abutment operating as the reel rotates in the pay-out direction to put the pawl sequentially and repetitively into the second position and the first position; and

said body having a pawl engaging means (62) adapted to engage the pawl, when the pawl is in the first position and the reel rotates in the winding-in direction whereby to prevent winding-in and which does not engage the pawl when the pawl is in the second position when the reel rotates in the winding-in direction so that winding-in is not prevented and can take place.

4,511,102

BOBBIN HOLDER

Zenzaburo Tsukumo; Masae Tsukumo, and Shinsuke Tsukumo, all of 5-5, Sakuradai 3-chome, Nakayama, Takarazuka, Hyogo 665, Japan

PCT No. PCT/JP81/00140, § 371 Date Feb. 16, 1983, § 102(e) Date Feb. 16, 1983, PCT Pub. No. WO82/04433, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 16, 1981, Ser. No. 474,679

Int. Cl.³ B65H *49/02;* D03J *5/08*

U.S. Cl. 242—130.2 **4 Claims**

1. A bobbin holder comprising:

(a) an upper suspending structure;

(b) a hanging member being suspended by said upper suspending structure, being rotatable around a center axis, and being rockable with respect to said upper suspending structure;

(c) said hanging member having a cylindrical outer surface, a chamber, three guide grooves, and three rockably supporting portions;

(d) said three guide grooves opening into said chamber, extending in a direction of said axis, and being arranged radially and symmetrically with respect to said axis;

(e) three rockable elements; each rockable element having a triangle-like profile and a bottom portion supported with said each rockably supporting portion; an upper outside surface of said rockable element being formed as an inclined shoulder; and an upper inside surface of said rockable element being formed as an engaging surface,

(f) said rockable elements being rockable in a limited range outwardly or inwardly around said bottom portions; in an outward position, said upper outside surfaces being arranged along a conical surface of an immaginary cone; said immaginary cone having a top angle of 60 to 90 degrees;

(g) said three rockably supporting portions formed at the bottom of said chamber, being arranged near the outer surface of the hanging member and beneath said guide grooves, in a radial and symmetric arrangement with respect to said center axis;

(h) a core member contained in said chamber; said core member being shiftable along said center axis;

(i) a control means for locking said core member in an upper shifted position or a lower shifted position;

(j) whereby, when said core member is shfited into lower position, said core member is engaged with said engaging surfaces of said rockable elements in order to hold said rockable elements opened outwardly; and

when said core member is shifted into upper position, said core member is disengaged from said engaging surfaces of said rockable elements in order to allow said rockable elements to be rockable freely.

4,511,103

TAPE END DETECTING DEVICE IN A TAPE PLAYER

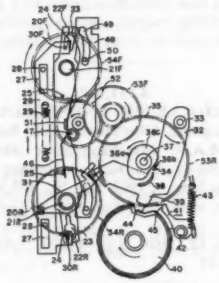
Hideki Hayashi; Yukio Ito; Yukio Akiike, and Shigeo Kinoshita, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1983, Ser. No. 533,373

Claims priority, application Japan, Sep. 24, 1982, 57-164991

Int. Cl.³ B65H *59/38;* G03B *1/04;* G11B *15/32*

U.S. Cl. 242—186 **6 Claims**



1. A tape end detecting device in a tape player which comprises:

a pair of reel bases;

a check plate operatively linked to one of said reel bases;

a guide hole formed in said check plate and divided into a reset region and a set region by a projection extending into said guide hole;

a check pin slidably engaging said guide hole;

a detection plate formed at one end thereof with said check pin;

a rotation plate;

first cam formed on said rotation plate;

second cam formed on said rotation plate radially outwardly of said first cam;

a cam follower operatively linked to the other end of said detection plate and moved by said first cam to reciprocate said check pin from said set region to said reset region of said guide hole or, alternatively, moved by said second cam when said check pin engages said projection in said guide hole;

said first cam including a set cam surface to reciprocate said check pin in said set region of said guide hole, a reset cam surface to reciprocate said check pin in said reset region beyond said projection of said guide hole, said set cam surface having a larger revolution angle than that of said reset cam surface.

4,511,104

TABLE-LIKE SUPPORT INSTALLATION FOR PAPERS, ESPECIALLY AT A COVERING FRAME OF A SLIDING WINDOW

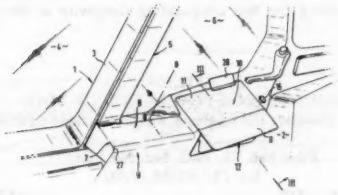
Juergen Meyer, Vaihingen/Enz, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Mar. 11, 1983, Ser. No. 474,515

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3209408

Int. Cl.³ B64D *11/00*

U.S. Cl. 244—118.5 **18 Claims**



1. A table-like support installation providing a substantially planar surface associated with a frame of a movable window, the movable window including a first frame section and a second frame section extending generally perpendicularly to said first frame section, the support installation comprising a plurality of support element means for forming a substantially planar surface, one of said support element means being fixedly mounted to the first frame section and a second of said support element means being movable from a rest position extending along the second frame section into an operating position forming an extension of the fixed first support element means, and latching means for locking said second support section in said operating position, said latching means being releasably manually and releasable by movement of said movable window thereby allowing said second support section to move from said operating position to said rest position.

4,511,105

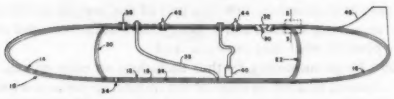
COMPARTMENTED, FILAMENT WOUND, ONE-PIECE AIRCRAFT FUEL TANKS

Edward J. Morrisey, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 339,258, Jan. 13, 1982, Pat. No. 4,453,995. This application Feb. 22, 1984, Ser. No. 582,514

Int. Cl.³ B64D *37/04*

U.S. Cl. 244—135 R **6 Claims**



1. A fuel tank for external mounting on an aircraft which comprises:

a. at least one elongated, generally cylindrical fuel cell having generally dome-shaped end portions, said fuel cell being formed of a plurality of layers of adhesive resin-impregnated filament wrappings, and having an imaginary central longitudinal axis;

b. first and second aerodynamic end shapes, each having an open end having an outer diameter approximately equal to the outer diameter of said fuel cell, said open end of each of said end shapes having an inside bevel having a slope complimentary to the shape of said end portion of said cell, and each end shape having an imaginary central longitudinal axis, said first and second end shapes being positioned at each end of said fuel cell with the open ends of said end shapes over the endmost portions of said fuel cell and with the axes of said end shapes juxtaposed with the axis of said fuel cell;

c. a plurality of outer layers of adhesive resin-impregnated filament wrappings surrounding said fuel cell and said end shapes, thereby providing an integral structure;

d. fuel filling and transfer fitments comprising means for filling said cell, means for draining said cell, fuel level sensing means, means for venting said cell and means for withdrawing fuel from said cell;

e. means for detachably mounting said tank to an aircraft; and

f. means attached to at least one of said end portions for imparting aerodynamic stability to said fuel tank.

4,511,106

HEAT EXCHANGER SUPPORT SYSTEM PROVIDING FOR THERMAL ISOLATION AND GROWTH

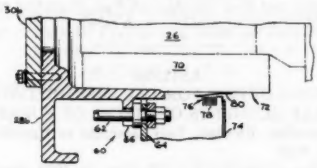
Richard F. Graves, Huntington Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 955,117, Oct. 26, 1978,. This application Aug. 14, 1981, Ser. No. 293,914

The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.³ F16L *21/00*

U.S. Cl. 248—65 **9 Claims**



1. A thermally isolating member for joining a high temperature component to a support structure with minimal heat transfer comprising:

a circumferential member having a thin metal wall to restrict the heat flow; and

means for connecting the thin-walled member at opposite ends respectively to the high temperature component and the support structure, said means further including means for accommodating relative movement from thermal growth of the high temperature component;

the circumferential member comprising a thin-walled wishbone-shaped member in combination with a circumferential bellows portion which is attached to the support structure, the bellows portion being aligned generally parallel to the axis of the high temperature component, extending circumferentially about said component, and being spaced therefrom, the wishbone-shaped member formed of two thin-walled metal collar portions joined together along a common edge, the opposite edges thereof being connected respectively to the high temperature component and to the circumferential bellows portion at a point remote from the support structure.

4,511,107

ONE-PIECE CLAMP

Richard J. Funk, 393 Valleybrook, Lancaster, Pa. 17601

Filed Aug. 27, 1982, Ser. No. 412,235

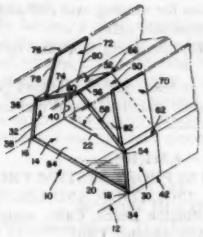
Int. Cl.³ F16L *3/08*

U.S. Cl. 248—74.1 **6 Claims**

1. A clamp comprising:

a unitary, one-piece body having an elongate bottom panel which includes side edges and end edges, a pair of elongate side panels each including side edges and end edges one of which is integrally attached to a corresponding one of said bottom panel end edges to form a corner, a pair of

elongate top panels each including side edges and end edges one end edge of which is integrally and flexibly attached to another end edge of a corresponding one of said side panels to form a hinge, and a pair of elongate top crosspanels each including side edges and end edges one of which is integrally attached to a corresponding one of said top panels to form an angle therewith;



said top panels being hingably connected together at the other said end edges thereof; and

said top cross-panels being located and said angles being selected so that when said top panels are oriented to have the other of their respective end edges contacting said bottom panel, said top cross-panels will be essentially co-planar and have the other of their respective end edges located closely adjacent to each other.

4,511,108

LOCKING DEVICE FOR THE ASSEMBLING OF MODULAR ELEMENTS OF PIECES OF FURNITURE

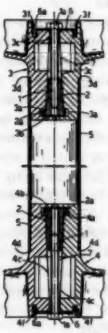
Giulio Ponzellini, Bologna, Italy, assignor to Castelli S.p.A., Bologna, Italy

Continuation of Ser. No. 243,714, Mar. 16, 1981, abandoned. This application Aug. 23, 1984, Ser. No. 644,134

Claims priority, application Italy, Mar. 18, 1980, 48194 A/80

Int. Cl.³ F16M *11/20*

U.S. Cl. 248—188.7 **6 Claims**



1. In a standard or support for furniture comprising a column which is hollow at least at its ends; a plurality of independent radial arm members and a plurality of independent radial foot members, each of said arm and foot members defining discrete, unitary elements, and having an inner end portion in the form of a sector of a cylinder having a tapered axial hole and being adapted to be partially received in the inside of the hollow end portion of the column together with other sector-like elements, a locking device for each of said arm and foot members, said locking device comprising a threaded bolt having an enlarged head including a washer resting on the upper ends of the inner sector-like elements of the arm members or on the lower ends of the inner sector-like elements of the foot members respectively, each sector-like element having an outer annular partial shoulder by means of which said sector-like elements of the arm members and foot members abut against the upper or lower end of the column respectively, said bolt being screwed at its inner portion in an axial threaded hole of a rigid frusto-conical body having its greatest base towards the inner portion of this bolt, said tapered hole being formed by the axial hole sectors of the inner sector-like elements of the arm members and foot members respectively being tapered to correspond to the outer surface of the body, and means for preventing any rotary movement of the body with respect to the arm or foot members, but enabling the body to move axially to and from the head along the bolt cooperating therewith as the bolt is screwed.

4,511,109

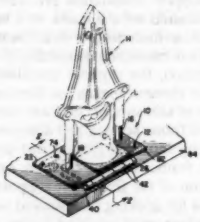
MOUNT FOR A POWER RESCUE TOOL

Joseph A. Cadillac, 192 Chestnut Ridge Rd., Saddle River, N.J. 07458

Filed Feb. 19, 1982, Ser. No. 350,277

Int. Cl.³ F16M *11/00*

U.S. Cl. 248—310 **11 Claims**



1. A mount for a power rescue tool comprising:

a hinge having one leaf thereof fixed on a mounting surface and a second leaf pivotably connected thereto;

an elongate mounting plate fixed to said hinge second leaf for movement therewith;

a pair of spaced leg holders mounted on said plate on opposite sides of a centerline of said plate for slidingly accommodating legs of a power rescue tool;

a cushion mounted on said plate between said leg holders;

a catch means for maintaining said plate releasably attached to said mounting surface;

a tool movement limiting means for limiting the pivotal movement of said plate so that a power rescue tool can be mounted thereon for expeditious removal thereof without the danger of flipping over too far;

said catch means including a pair of anchors mounted on the mounting surface and a pair of backstops mounted on said plate to abut said anchors; and

said hinge mounting further including an edge of said plate located to abut an edge of the mounting surface when said plate is in a level orientation and essentially coplanar with the mounting surface.

4,511,110

SCISSORS LIFT TABLE

Reinfried Möller, Weinheim, Fed. Rep. of Germany, assignor to Expert Maschinenbau GmbH, Lorsch, Fed. Rep. of Germany

Filed Mar. 8, 1983, Ser. No. 473,350

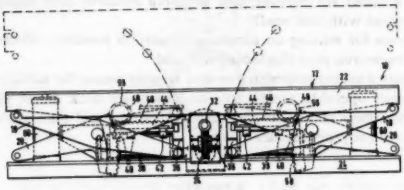
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1982, 3208400

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—421 **6 Claims**

1. A scissors lift table comprising a lift platform, a scissors mechanism for raising said platform above and for lowering said platform onto a base frame in a vertical direction, said

scissors mechanism comprising at least two laterally adjacent scissors arm pairs, each comprising two scissors arms mutually pivotably coupled in their median region and pivotable relative to each other, drive means for pivoting said arms, one end of each arm of each arm pair being mounted stationarily but rotatably on the lift platform or the base frame respectively and the other end of each arm of each pair being slidably guided in the base frame or the lift platform respectively, said drive means comprising an elongate cylindrical roller adapted to be motor-driven in rotation, which is mounted stationarily



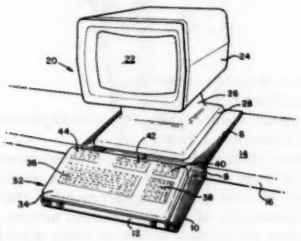
relative to the base frame and has an indexing groove provided in its cylindrical surface as a driving member, an indexing pin which engages in the groove and is arranged on a driven member forming an elongate carriage which is guided for longitudinal sliding movement, the carriage carrying a rack which meshes with a first toothed pinion which is operatively coupled with a second toothed pinion which meshes with a toothed segment on one of the scissors arms, the center of the pitch circle radius of the toothed segment coinciding with the stationary pivot point of said scissors arm on the base frame.

4,511,111

PORTABLE KEYBOARD SUPPORT

Steven W. Godfrey, Florence, Ky.; Allen M. Stern, Havertown, Pa., and Fran W. MacGregor, New Britain, Conn., assignors to Hunt Manufacturing Co., Philadelphia, Pa.

Filed Feb. 10, 1983, Ser. No. 465,668
Int. Cl.³ A47G *29/10*
U.S. Cl. 248—459 **3 Claims**



1. An integral portable keyboard support for use with a table and a weight such as a display screen, computer or printer for supporting a keyboard comprising:

a single sheet of material with,

means for holding the keyboard support in place including a first flat rear laterally extending planar member adapted to lie on a table surface and support a weight for holding the first member to the table surface,

said first member having a front edge and a rear edge,

means for supporting a keyboard including a second flat laterally extending planar member in front of and below the first member,

said second member having a front edge and a rear edge,

said second member sloping downwardly from the rear thereof to the front thereof for supporting a keyboard,

a third laterally extending planar member connecting the first and second members and adapted to abut against the front end of the table,

said third member depending downwardly from the front edge of the first member to the rear edge of the second member, and

an upstanding flange at the front edge of the second member acting as a stop to hold a keyboard on the second member,

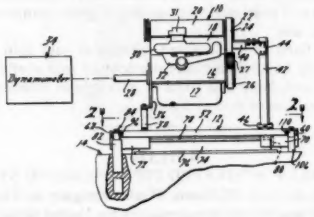
whereby the keyboard support may be placed on a table with its first flat member positioned flat against the table top and a display placed on top of the first flat member to anchor the keyboard support in place, the third member may be placed to abut the edge of the table, and a keyboard may be placed on the sloped second member and supported thereby.

4,511,112

ENGINE TEST STAND

Edward A. Ruehle, Redford Township, Wayne County, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 22, 1982, Ser. No. 360,279
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—544 **8 Claims**



1. For test mounting an engine in accurate alignment and proximity to a dynamometer; an engine support means comprising; a frame including longitudinally extending members in substantial parallelism one with the other and generally aligned with the engine crankshaft; laterally extending end members directed substantially normal to the longitudinally extending members, all members being attached rigidly to one another in a single plane; engine bracket support means attaching to the longitudinal members and extending upward for attachment to the test engine; a plurality of ground post means to support the frame structure at least three points about its perimeter, the post supports extending into the ground sufficiently to provide a solid attachment of the frame to the ground; spacer means between the frame structure and the post supports constructed to provide a level surface of the frame; means between at least two of the spacer means and the respective post supports relating thereto being configured with matching surface configurations so that when the frame moves into approximate location with respect to the post support and is lowered thereto, the surfaces engage to align the frame structure with respect to the post supports so that an accurate positioning of the frame structure is formed with respect to the posts and an associated dynamometer; fastener means extending through the spacer means to rigidly secure the frame to the post structure.

4,511,113

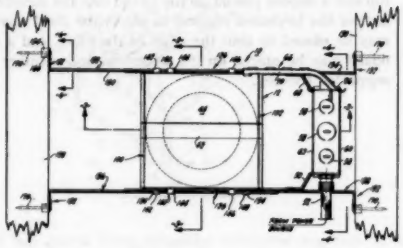
HANGAR DEVICE FOR A RECESSED LIGHTING UNIT

James B. Druffel, and Joel S. Cohen, both of Oakland, Calif., assignors to Prescolite, a division of U.S. Industries, San Leandro, Calif.

Continuation-in-part of Ser. No. 222,042, Jan. 2, 1981, Pat. No. 4,388,677. This application Apr. 8, 1982, Ser. No. 351,877

Int. Cl.[3] F16M *1/00*

U.S. Cl. 248—546 4 Claims



1. A hanger device for holding a body to a pair of beams comprising:

a. a pair of elongated members slidable in relation to one another, each of said pair of elongated members including a shaft having side portions, and means for fastening each of said pair of elongated members to each of the beams said means including at least one of said elongated members including an end portion having an end piece fixed at an angle to said shaft, said end piece further including a split member having a first and a second portion in side-by-side relationship; said first portion of said split member including first and second sections said first section including an end portion being capable of penetrating any of the beams, and

b. a lip fixed to said second portion of said split member laterally beyond said side portions of said shafts of elongated members, and fixed at an angle in relation to said first portion of said end piece.

4,511,114

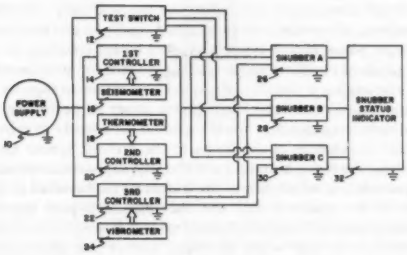
CENTRALLY ACTIVATED PIPE SNUBBING SYSTEM

William E. Cawley, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 18, 1982, Ser. No. 340,450

Int. Cl.[3] F16M *13/00*

U.S. Cl. 248—550 11 Claims



1. A pipe support system comprising:

a plurality of snubbers for supporting a pipe system, each of said snubbers including means operable to lock the associated snubber in a position restraining pipe displacements and to unlock said associated snubber in a position permitting normal pipe displacements, each said snubber mounted between a pipe member and a structural support member and comprising a housing connected to one of said members and a shaft connected to the other of said members, said shaft mounted within said housing for relative reciprocal movemment thereto upon relative movement between said members, means for locking said shaft to said housing, said locking means comprising at least one gripping member mounted on said housing for movement relative thereto and engagable with said shaft to prevent movement between said housing and said shaft, and means on said housing connected to said gripping member for moving said gripping member into engagement with said shaft;

means for sensing an abnormal condition possibly effecting excessive pipe displacements; and

control means responsive to said sensing means for actuating said operable means to simultaneously lock all of said snubbers in unison and thereby restrain said pipe system against pipe displacements.

4,511,115

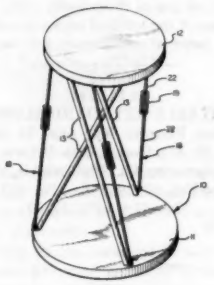
PASSIVE STRUCTURE WITH ENERGY ABSORBING CAPACITY

John S. Ludwigsen, Naperville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jan. 27, 1984, Ser. No. 574,348

Int. Cl.[3] F16M *13/00*

U.S. Cl. 248—562 5 Claims



1. A support structure comprising:

a lower base member;

an upper support member spaced from said base member and adapted to support a load;

at least three elongated rigid compression members each having its lower end pivoted on said base member and its upper end pivoted on said support member, the points of pivotal connection of said compression members to each of said base and support members being spaced about a closed curve; and

at least three elastic tension members interconnecting said base and support members.

4,511,116

VARIABLE OPENING PINCH SLEEVE VALVE

Lawrence D. A. Jackson, Quebec, Canada, assignor to Linatex Canada Inc., Montreal, Canada

Filed Mar. 17, 1980, Ser. No. 131,195

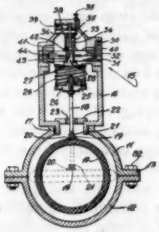
Int. Cl.[3] F16L *55/14;* F16K *31/126*

U.S. Cl. 251—5 4 Claims

1. A pinch sleeve valve controllable opening positions regardless of internal sleeve pressure, comprising

a flexible sleeve having a passageway therethrough, the sleeve having variable positions from a round cross section when fully open, to a collapsed cross section when closed,

a rigid pressure sealed housing containing the sleeve,
sensing means connected to the flexible sleeve adapted to sense whether the sleeve is fully open, partially open or closed,
a valve positioner connected to the sensing means to supply fluid to the housing at a pressure sufficiently higher than



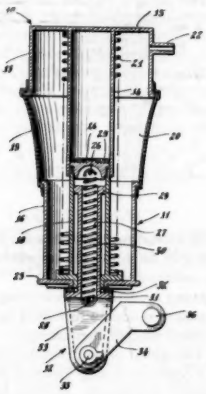
the internal sleeve pressure to close the sleeve to the desired opening position, said valve positioner including a control means to adjust the pressure of the fluid supplied to the housing to maintain the desired opening position of the sleeve regardless of variations in the internal sleeve pressure.

4,511,117

ACTIVATING APPARATUS IN A LIQUID CONVEYING SYSTEM OPERATED BY VACUUM, PREFERABLY A SO-CALLED VACUUM SEWAGE SYSTEM

Sigvard V. Söderström, Hägersten, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Dec. 8, 1983, Ser. No. 559,476
Claims priority, application Sweden, Dec. 15, 1982, 8207172
Int. Cl.³ F15B *15/26;* F16K *31/56*
U.S. Cl. 251—73 **2 Claims**



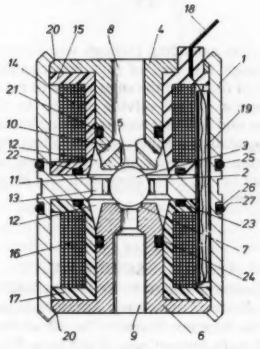
1. In an actuating apparatus for a liquid conveying system operated by means of a vacuum, such as a vacuum sewage system having a valve, the improvement comprising: an operating device for said valve movable between a first and second position, a housing, a chamber, a force accumulator which is movable with respect to said housing, the housing and the force accumulator forming parts of said chamber which is connected to the vacuum of said system and is contractable under the influence of the vacuum in said chamber, means being coupled between said operating device and said force accumulator, a latching member coacting with said operating device by retaining the latter in said first position, while said force accumulator initially is actuated by means of the vacuum, said force accumulator being operatively connected to said operating device in such a manner that when said latching member is released, the operating device is moved to said second position by said means, said operating device being provided with a movable arm having a projection at a free end, said latching member being in the form of a second arm, said projection being latched by means of a spring biasing said second arm into engagement therewith, and said second arm during the movement of said force accumulator being acted upon by said force accumulator whereby said projection is released from said second arm and the operating device moves to the second position to cause said valve to operate.

4,511,118

ELECTROMAGNETIC BALL VALVE

Uwe Kühl, Mustin; Andreas Krause, Lubeck, and Horst Krüger, Stockelsdorf, all of Fed. Rep. of Germany, assignors to Dräger werk Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,263
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1982, 3231172
Int. Cl.³ F16K *31/02*
U.S. Cl. 251—137 **4 Claims**



1. An electromagnetic ball valve for a flow medium under pressure, comprising an exterior cylindrical sheath having an opening at each end, an upper and a lower pole piece having aligned axial bores opened at each of their outer ends and being spaced apart at their inner ends arranged within said sheath, the inner ends being spaced apart to define a ball guideway therebetween, an abutment defined at the lower end of the upper pole piece axial bore and a seat defined at the upper end of the lower pole piece axial bore, a ball positioned in said guideway between said abutment and said seat, said guideway including a space around said ball, said upper pole bore having an always open communication passage connecting said bore to the space surrounding said ball, an upper and a lower magnet coil disposed around respective upper and lower poles, said ball being movable in said guideway between said seat and said abutment under the control of said coils.

4,511,119

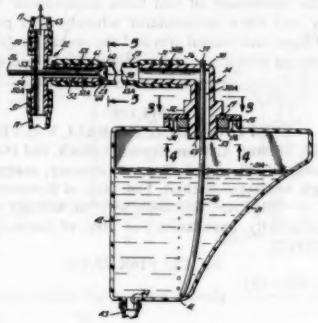
ADJUSTABLE VALVE ASSEMBLY

Robert V. Albertson, 2100 Shadywood Rd., Wayzata, Minn. 55391

Filed Jul. 26, 1982, Ser. No. 402,055
Int. Cl.³ F16K *31/44*
U.S. Cl. 251—216 **6 Claims**

1. In combination: a first fitting having a wall comprising first and second conduits having axes intersecting at generally a right angle, and a tube co-axial with said first conduit and

passing in sealed relation through a hole in the wall of said fitting; a second fitting comprising a first conduit having a wall and a first axis, a branch conduit having a second axis and intersecting said first conduit so that axes are generally perpendicular, a first valving surface at the outer end of said branch conduit, a valving member including means having a second valving surface movable relative to said first valving surface for controlling the flow of fluid through the branch conduit, and a stem joined to the means having the second valving



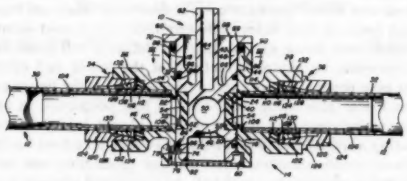
surface, said stem extending through said branch conduit and threaded through the wall of said first conduit, and means outside said first fitting on the stem usable to rotate the stem to adjust the position of said valving member to change the distance between said first and second valving surfaces and maintain said changed distance thereby controlling the flow of fluid through the branch conduit and; tubular means connecting said second conduit of said first fitting with said branch conduit of said second fitting.

4,511,120

PLASTIC SERVICE VALVE

Richard W. Conley; Richard P. Tremblay, both of Pittsburgh; Charles W. Bolam, Canonsburg; James E. Logan, Pittsburgh, and David A. Krueger, Harleysville, all of Pa., assignors to Kerotest Manufacturing Corp., Pittsburgh, Pa.

Filed Mar. 11, 1983, Ser. No. 474,468
Int. Cl.³ F16K *51/00*
U.S. Cl. 251—288 **24 Claims**



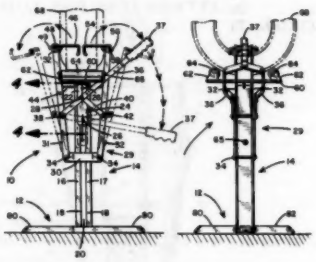
1. A service valve comprising,
a valve body molded of plastic material and having a chamber with an upper portion and a lower portion,
said lower portion having an inlet opening and an outlet opening,
a valve seat in said chamber lower portion between said inlet and outlet openings,
a valve member positioned in said valve seat between said inlet and outlet openings,
said valve member being molded of plastic material to form a unitary body including a plug portion and an actuator portion,
said plug portion having a flow passage therethrough,
said plug portion being rotatable in said valve seat between an open position where said flow passage is aligned with said inlet and outlet openings and a closed position where said flow passage is out of alignment with said inlet and outlet openings to control the flow of fluid through said chamber lower portion,
said actuator portion extending upwardly from said plug portion through said chamber upper portion, said actuator portion including a flange and a stem,
said flange and said stem being integral with said plug portion to form said valve member unitary body,
said flange being spaced circumferentially around said stem and including a first portion extending upwardly between said valve body and said stem and a second portion positioned in overlying relation with said valve body and thereby closing said chamber upper portion,
said stem projecting upwardly from within said flange and above said valve body,
said valve body including an upper shoulder forming a bearing surface extending circumferentially around said chamber upper portion for receiving said flange second portion, and
said flange second portion being positioned on said upper shoulder to support said actuator portion on said valve body so that impact forces applied to said actuator portion are transmitted from said flange to said valve body bearing surface and distributed throughout said valve body away from said stem and said plug.

4,511,121

TIRE SPREADER

Marshall R. Bulle, 917 2nd St., Farmington, Minn. 55024, and Dale A. Johnson, 6336-19th Ave. S., Richfield, Minn. 55423

Filed May 25, 1984, Ser. No. 614,314
Int. Cl.³ B60C *25/14*
U.S. Cl. 254—50.4 **5 Claims**



1. A device for spreading the side walls of a cord-reinforced vehicle tire casing to facilitate the inspection and repair of the interior of said casing, comprising:
(a) a stand having a vertically extending post member;
(b) carriage means slideably mounted on said post member for a reciprocal motion therealong;
(c) a pair of elongated arms pivotably coupled at one end thereof to a common spacer member and having rotatable hook members operatively coupled to the other end of said elongated arms;
(d) an operating lever pivotably coupled at one end to one of said pair of elongated arms at a point on said one of said pair of elongated arms intermediate said one and other ends thereof; said operating lever being movable between a raised and a lowered position;
(e) linkage means pivotably joined to the other of said pair of elongated arms at a point intermediate said one and other ends thereof and pivotably joined to said operating lever and to said carriage means;
(f) means for supporting a tire casing in a generally vertical plane such that said hook members can be made to engage

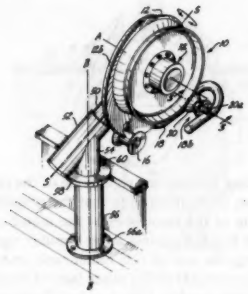
the bead of said tire when said operating lever is in said raised position and said hook members apply a separating force when said operating lever is moved to its lowered position.

4,511,122

DEEPWATER KING CRAB POT LINE HAULER

Robert A. Svendsen, Seattle, Wash., assignor to Marine Construction & Design Co., Seattle, Wash.

Filed Sep. 30, 1983, Ser. No. 537,863
Int. Cl.³ B66D *1/08*
U.S. Cl. 254—332 **9 Claims**



6. A deep water line hauler comprising a hauler head assembly including a V-grooved line hauler sheave, power means for driving the sheave for rotation in a sheave plane, and line guide means for leading line to and from the sheave during operation of the hauler, a first cantilever support member carrying the hauler head assembly, a second cantilever support member rotatably mounting said first cantilever support member as a continuation thereof, an upright base member fixedly mounted on the vessel, and a third cantilever support member rotatably engaging the base member and providing support to the second cantilever support member, the first cantilever support member projecting from said second cantilever support member and being rotatable about an inclined swivel axis transverse to said base member, said swivel axis formed by said first and second cantilever support members intersecting said sheave plane formed by the roational plane of the sheave at an acute angle so as to offset said sheave plane from said upright base member.

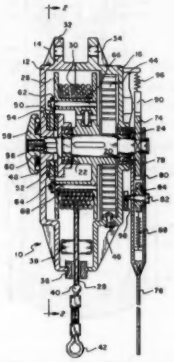
4,511,123

SAFETY DEVICE

Meyer Ostrobrod, 6723 Castor Ave., Philadelphia, Pa. 19149

Filed Jun. 2, 1983, Ser. No. 500,342
Int. Cl.³ B66D *1/06, 5/14*
U.S. Cl. 254—364 **4 Claims**

1. A safety device comprising:
a housing including support means adjacent the upper end and a cable outlet adjacent the lower end thereof;
a drum within said housing, said drum being secured to a shaft which is coaxial therewith and which shaft is mounted for rotation;
a cable adapted to be wound around said drum, one end of said cable extending through said outlet and being adapted to be connected to a harness worn by a workman;
a spiral spring coaxially arranged with respect to said shaft, one end of said spring being fixed to said housing and the other end being attached to said shaft whereby said spring acts to rotate said drum to wind the cable thereon whenever said cable is withdrawn from said housing;
braking means mounted within said housing and being coaxially arranged with respect to said shaft, said braking means including a braking ratchet;
a centrifugally operated braking pawl mounted for rotation with said drum, spring means biasing said braking pawl into an inoperative position wherein it does not engage said braking ratchet so that said drum can rotate freely to allow said cable to be freely drawn into or out of said housing through said cable outlet, said braking pawl being automatically movable into an operative position at a predetermined drum speed wherein it engages said braking ratchet to activate said braking means which initially slows said drum down thereby slowing down the withdrawal of said cable from said housing and which braking means then fully stops the withdrawal of said cable further



including means mounted on said housing for locking said manually operated lever against pivotal movement;
means carried by said housing for manually rewinding said cable into said drum, said rewinding means including a rewinding ratchet fixedly secured directly to said shaft and a manually operated lever pivotally mounted on said housing, said lever carrying a rewinding pawl which is movable between an inoperative position and an operative position wherein said rewinding pawl engages said rewinding ratchet to rewind said cable onto said drum when said lever is manually operated.

4,511,124

METHOD AND COMPOSITION FOR FLUIDIZATION OF ACCUMULATED PIT SCRAP IN SOAKING PITS

Charles D. Roberts, Longview, and Ben R. Cave, Avinger, both of Tex., assignors to Lone Star Steel Company, Dallas, Tex.

Filed May 3, 1983, Ser. No. 491,166
Int. Cl.³ B08B *7/04*
U.S. Cl. 266—44 **4 Claims**

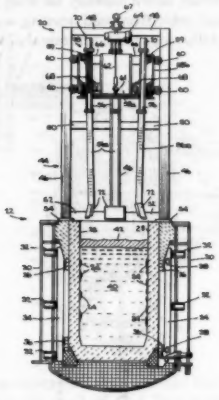
1. A method of fluidizing accumulated pit scrap, primarily mixtures of FeO, Fe_3O_4 and SiO_2, in a soaking pit, comprising adding to the soaking pit an effective fluidizing amount of a composition consisting essentially of about 38 to about 56 wt. % SiO_2 in the form of clean silica sand, from about 38 to 56 wt. % scarfing kerf containing about 85% FeO, and from about 2 to about 4 wt. % C, and maintaining the soaking pit at a temperature and for a time sufficient to fluidize the accumulated pit scrap.

4,511,125

LADLE SCRAPER MECHANISM

Otto Hochstrasser, Franklin Park; Hans G. Heine, Little Silver, and Heinz Buechi, North Brunswick, all of N.J., assignors to BBC Brown Boveri, Inc., North Brunswick, N.J.

Filed Nov. 18, 1983, Ser. No. 553,144
Int. Cl.³ F27D *23/02*
U.S. Cl. 266—135 **19 Claims**



1. A ladle scraper mechanism for scraping incrustations off the interior wall of a ladle containing a molten metal, said mechanism comprising:

a frame constructed to be mounted over said ladle and having at least one vertical guide;

a carrier assembly mounted to be moved up and down in said frame and to be guided by said vertical guide;

at least one elongated scraper leg having a scraper element at its lower end;

scraper leg mounting means for mounting the upper end of said scraper leg to said carrier assembly so that said scraper leg extends down into said ladle, said mounting means including a flexible element permitting limited vertical movement of said scraper leg relative to said carrier assembly and limited pivotal movement of said scraper leg about a horizontal axis;

an actuator mounted on said carrier assembly and arranged to exert a horizontal force on said scraper leg at a location vertically displaced from said horizontal axis to cause the lower end of the scraper leg to swing toward or away from the ladle wall being scraped; and

a vibrator mounted on the upper end of said scraper leg to induce vertical vibratory motion to said leg.

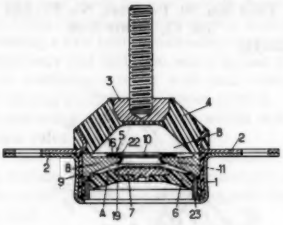
4,511,126

HYDRAULIC MEMBRANE SHOCK ABSORBERS

Marc Bernuchon, Saint Leu La Foret; Michel Pompei, Paris, and Daniel Gregoire, Chateaudun, all of France, assignors to Hutchinson, Paris, France

Filed Mar. 2, 1983, Ser. No. 471,303
Claims priority, application France, Mar. 3, 1982, 82 03546
Int. Cl.³ F16M *13/00;* **B60G** *11/62;* **F16J** *15/52*
U.S. Cl. 267—140.1 **10 Claims**

1. A device for damping the relative movements between two rigid elements, formed by a sealed case interposed between the two rigid elements, which case comprises two rigid pieces (1,3) interlockable respectively with the two rigid elements, a dividing wall (5) in which is formed a restricted passage (11), dividing the inside of the case into first and second compartments, a liquid mass filling the first compartment and at least the part of the second compartment adjacent the dividing wall, means (4) for connecting sealingly together the two rigid pieces while allowing relative reciprocating movements thereof with corresponding modification of the volume of at least the first compartment, a deformable membrane (10) delimiting a part of the first compartment and means for limiting to a low amplitude, which is less than 0.5 mm, the deformations of this membrane, said membrane being formed by a continuous impervious and flexible foil whose edge is sealingly mounted on a rigid seat forming part of the case and the restricted passage being formed in a rigid zone of the case spaced from the membrane, characterized in that the peripheral annular zone (13) of one of the two faces of the membrane (10) is applied axially and bonded against a flat annular rigid bearing surface (14) forming the seat of this membrane, and in that an annular peripheral zone (15) of the other face of the membrane is covered by a rigid washer (16) bonded floatingly to this zone.

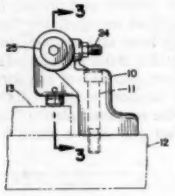


4,511,127

HYDRAULIC-MECHANICAL CLAMPING DEVICE

Jack H. Schron, Chagrin Falls, and Lawrence H. Seidel, Mentor, both of Ohio, assignors to Jergens, Inc., Cleveland, Ohio

Filed Apr. 18, 1983, Ser. No. 485,861
Int. Cl.³ B23Q *3/08*
U.S. Cl. 269—32 **4 Claims**



1. A compact self-locking hydraulic clamping device comprising a body, a primary bore extending from an end of said body, a secondary bore intersecting said primary bore intermediately and extending normally to said primary bore from said primary bore to a face of said body, a piston slidably received in said primary bore and including a shank passing back and forth past the intersection between the primary and secondary bores, piston chamber defining means associated with said primary bore, compound camming surface means extending non-reentrantly across one side of said piston shank and positioned to pass back and forth over said secondary bore during said back and forth movement of said piston to present different stages of said compound camming surface means, a clamping pin in said secondary bore, said pin being biased toward said camming surface means by a spring located in said secondary bore, a key preventing rotation of said clamping pin with respect to said body, follower means on the inner end of said clamping pin, said follower means engaging said compound camming surface in following relationship, said compound camming surface including a first stage which wedges said follower means and clamping pin relatively rapidly and in a non-self-locking manner during the earlier part of the piston's

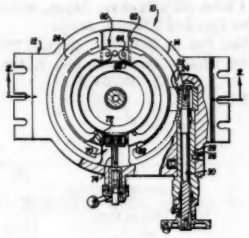
movement in the pin-extending direction, said compound camming surface including a second stage which wedges said follower means and clamping pin relatively slowly and in a self-locking manner during the latter part of the piston's movement in the pin-extending direction.

4,511,128

ROTARY TABLE

Joseph J. Dancsik, 37970 Pointe Rosa, Mt. Clemens, Mich. 48045

Filed Jul. 25, 1983, Ser. No. 517,073
Int. Cl.³ F16C *29/00*
U.S. Cl. 269—61 **5 Claims**



1. A rotary table for holding a workpiece for machining comprising: a base, a rotary member supported by the base, a transversely movable member carried by the rotary member, a laterally movable member carried by the transversely movable member, means for displacing the transversely movable member linearly relative to the rotary member, means for displacing the laterally movable member linearly relative to the transversely movable member, and a worm and worm gear means for selectively rotating the rotary member relative to the base, the invention comprising:

a thrust bearing for supporting the rotary member against the base, a biasing means abutting said thrust bearing at one end and abutting the rotary member at another end, whereby the rotary member lightly abuts the base and is supported by said thrust bearing with a minimum of friction;

an adjustable thrust bearing for selectively adjusting said biasing means to bring the rotary member into light contact with the base and allow the rotary member to rotate relative to the base with a minimum of friction;

said adjustable thrust bearing comprising:

a central post projecting axially from the rotary member, having a threaded end;

a central step bore having a shoulder formed in the base;

one end of said adjustable thrust bearing abutting said shoulder;

a threaded collar engaging said threaded end and abutting another end of said adjustable thrust bearing; and

whereby rotation of said threaded collar in one direction moves the rotary member against said biasing means and toward the base, and rotation of said threaded collar in a counter direction allows said biasing means to displace the rotary member away from the base.

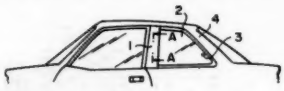
4,511,129

QUARTER-WINDOW STRUCTURE FOR VEHICLE

Kohji Kishino, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Japan

Filed Oct. 25, 1983, Ser. No. 545,188
Claims priority, application Japan, Oct. 25, 1982, 57-161997[U]; Dec. 1, 1982, 57-210997
Int. Cl.³ B60J *1/08*
U.S. Cl. 296—146 **11 Claims**

1. A quarter-window structure for a vehicle comprising a windowpane fitted on a side window frame, an opening-closing device which is connected between the rear end portion of the windowpane and the side window frame, a hinge which is fixed to the front end portion of the windowpane and extends substantially in parallel to the surface of the windowpane, a holder which is fixed to a center pillar of the vehicle and is provided with a hinge receiving opening, the hinge being



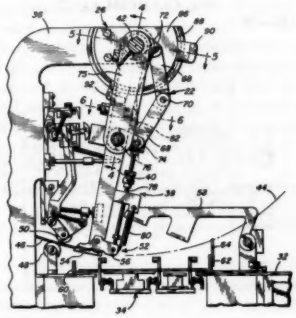
adapted to be passed through the hinge receiving opening of the holder by being moved forwardly with respect to the vehicle body, a fastener for fixing the free end portion of the hinge projecting forwardly from the hinge receiving opening of the holder to the center pillar from outside the vehicle body, and a garnish which covers the free end portion of the hinge and the holder.

4,511,130

PHASE CONTROLLED GRIPPER OPERATING SYSTEM FOR COLLATOR

Delmar O. Barton, Salem, and Loran R. Simpson, Ames, both of Iowa, assignors to Metromail Corporation, Mount Pleasant, Iowa

Filed Jul. 28, 1983, Ser. No. 518,038
Int. Cl.³ B65H *39/02*
U.S. Cl. 270—54 **12 Claims**

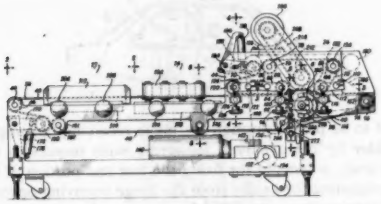


1. In combination with a cyclically displaceable gripper and mechanical drive means connected to the gripper for displacement thereof through a travel stroke of fixed amplitude, the improvement comprising mechanical linkage means connected to the gripper for cyclic operation thereof, and phase control means engageable with the linkage means for establishing a predetermined phase relationship between the cyclic operation of the gripper and the travel stroke, said phase control means including at least two trip elements engageable with said linkage means for imparting gripping and release movements thereto at selected phase locations during said displacement of the gripper.

4,511,131
METHOD AND APPARATUS FOR ALIGNING AND TRIMMING OVERLAPPED SIGNATURES

William B. Raybuck, Cocoa, Fla., assignor to Trimmer Machine Co., Inc., Dorset, Vt.

Filed Oct. 19, 1983, Ser. No. 543,362
Int. Cl.³ B65H 43/02
U.S. Cl. 270—54 56 Claims

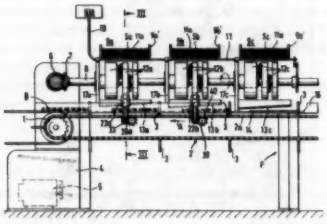


1. A signature trimmer for trimming the edge of an incoming stream of overlapping signatures comprising, first conveyor belt means adapted to engage the upper surface of a continuous stream of overlapping signatures, second conveyor belt means adapted to engage the bottom surface of said continuous stream of overlapping signatures, fluid pressure means for exerting a force on said first and second belt means in the direction to cause said first and second belt means firmly to grip said stream of overlapping signatures while permitting the tension in said belts to be reduced when bunched up signatures occur in said stream, and cutting means positioned to trim at least one edge of said stream of overlapping signature while the same is firmly held between said first and second belt means.

4,511,132
GATHERING MACHINE FOR PAPER SHEETS OR THE LIKE

Hans Müller, Zofingen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Nov. 14, 1979, Ser. No. 94,321
Claims priority, application Switzerland, Nov. 17, 1978, 11823/78
Int. Cl.³ B65H 39/02
U.S. Cl. 270—58 13 Claims

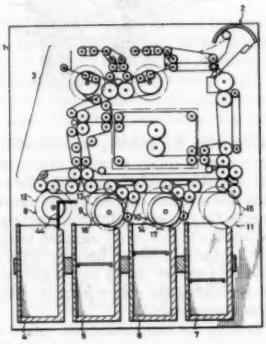


1. In a machine for gathering sheets into stacks or similar accumulation, the combination of a conveyor having a plurality of spaced-apart entraining means arranged to move in a predetermined direction and along a predetermined path; a plurality of supports adjacent to said path and disposed one after the other, as considered in said direction; transfer means for delivering sheets to said supports so that the delivered sheets extend into said path; a plurality of mobile combined advancing and hold-down devices, one for each of said supports, for urging the delivered sheets against the respective supports; and means for moving said devices into engagement with the sheets on said supports and thereupon at least substantially in said direction in synchronism with movements of said entraining means so that a sheet which is about to be engaged by the oncoming entraining means is urged against the respective support by the associated device and is already accelerated by such device with reference to and while contacting the respective support, only in said direction and at least approximately to the speed of said entraining means, before the accelerated sheet on its support is actually engaged by the oncoming entraining means.

4,511,133
DEVICE FOR SECURELY HOLDING STACKED BANK NOTES FOR USE IN AN AUTOMATIC MONEY DEPOSITING AND DISBURSING MACHINE

Eiichi Kokubo; Koichi Goi; Junichi Arikawa; Hideyuki Ebihara, and Hiroshi Chiba, all of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 462,992
Claims priority, application Japan, Feb. 4, 1982, 57-16597
Int. Cl.³ B65H 5/22
U.S. Cl. 271—3.1 2 Claims



1. A device for securely holding stacked bank notes and adapted to be assembled with an automatic money depositing and disbursing machine including a box for containing bank notes and having an upper opening through which bank notes are pulled out or stacked, a suction drum for sucking the uppermost bank note separately one by one from the underlying stacked bank notes contained in said box by applying a vacuum suction pressure on the upper surface of the uppermost bank note to pull the same out of said box, and an accumulating wheel adapted to be swung to the upper retracted position during the operation of sucking and separately pulling out the bank notes and adapted to be swung to the lower accumulating position during the operation of accumulating and stacking the bank notes into said box; said device comprises, in combination:

(a) a stopper swingably supported to be held normally at the position to constrain the fore edges of the stacked bank notes, to be swung to the position to release the fore edges of the stacked bank notes at the commencement of the operation of sucking and pulling out the bank notes from said box, to be restored to the normal position to prevent the remaining bank notes from being pulled out of said box at the termination of the operation of sucking and pulling out the bank notes, and to be inserted between paddles of said accumulating wheel to scrape off the bank notes held below respective paddles to let them fall down into said box during the operation of accumulating and stacking bank notes; and

(b) a push cover having an operation plate adapted to be set to the closed position to push the aft end portion of the stacked bank notes during the operation of sucking and pulling out the bank notes from said box, and adapted to

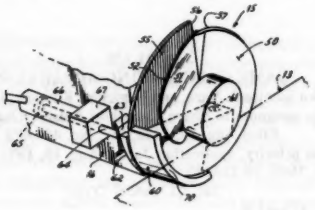
be set to the open position during the operation of accumulating and stacking bank notes.

4,511,134

LOCKOUT FOR A ROTARY FEEDER

Charles C. Hughes, Villa Hills, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Filed Aug. 29, 1983, Ser. No. 527,016
Int. Cl.³ B65H *3/28*
U.S. Cl. 271—113 **4 Claims**



1. A rotary feeder for sheets such as flat folded cartons comprising,

a hub,

a blade mounted on said hub to pass behind a leading sheet to separate it from the adjacent sheet,

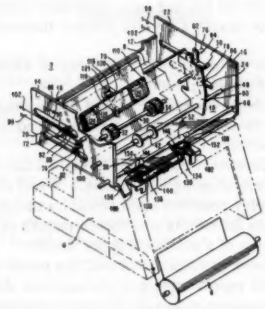
a lockout element movably mounted on said hub, said lockout element, when extended axially, projects beyond said blade, thereby engaging a leading sheet and holding it out of engagement by said blade.

4,511,135

ENHANCED ENVELOPE FEEDING

Jose L. Huerta, Austin; Roy A. Rachui, Georgetown; James E. Roberts, and Grainger I. Simpson, Jr., both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1982, Ser. No. 452,992
Int. Cl.³ B65H *1/08*
U.S. Cl. 271—126 **10 Claims**



1. In a hopper for holding envelopes on edge for separation for subsequent feeding to a printer or the like wherein the hopper comprises a base, two side walls and a moveable rear wall for urging the envelopes forward to separation station, said moveable wall being as wide as the distance between the two side walls, the width of the moveable wall being greater than the envelopes to be fed and the separation station being located off center of said moveable rear wall, the improvement comprising:

a separately moveable portion in said moveable rear wall;

said moveable portion being located in a correspondingly shaped opening in said rear wall;

said separately moveable portion being pivotable about an axis transverse to the direction of movement of the moveable rear wall;

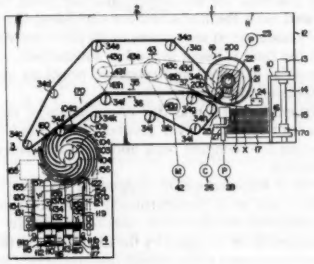
said separately moveable plate including a pair of resilient pads positioned to align with the separating means toward which the envelopes are urged by the moveable rear wall.

4,511,136

SHEET HANDLING DEVICE

Noboru Yamada, and Kunihiko Nakamura, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 18, 1982, Ser. No. 442,663
Claims priority, application Japan, Nov. 27, 1981, 56-189280
Int. Cl.³ B65H *29/34*
U.S. Cl. 271—187 **8 Claims**



1. A sheet handling device, comprising:

a conveyor belt system to carry leaves of paper one after another at a constant speed,

a plurality of rotating conveying wheels each having an arcuate groove for successively receiving said leaves of paper carried through said conveyor belt system, the tangential velocity of said rotating conveying wheels, at the inlet of said arcuate groove being set to a speed lower than the running speed of the leaf of paper at the outlet of said belt conveying system,

means installed along the side of said rotating conveying wheels for stopping leaves of paper held in said arcuate grooves to allow the same to be discharged and fall via gravity,

a device for piling said falling leaves, and a grouping device having at least two supporting bar members to be projected laterally under the leaf of paper coming after the last of the leaves of paper to be grouped to a preset count, when said leaf of paper coming next is discharged out of said arcuate groove, said grouping device further comprising:

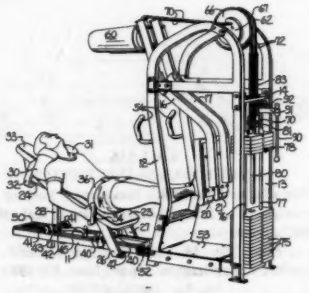
projecting devices for individually projecting said supporting members,

and moving mechanisms for vertically moving said projecting devices in the space where leaves of paper fall after being discharged from said arcuate groove, wherein the one of said at least two supporting bar members is located farther from said stopping means than the other supporting bar member and is projected at a higher position in said space earlier than the other supporting bar member.

4,511,137
COMPOUND WEIGHT LIFTING EXERCISING MACHINE

Arthur A. Jones, Lake Helen, Fla., assignor to Nautilus Sports/-Medical Industries, Inc., Lake Helen, Fla.

Filed Jan. 20, 1983, Ser. No. 459,360
Int. Cl.[3] A63B 21/06
U.S. Cl. 272—118 9 Claims



1. A machine for the compound exercising of the muscles associated with the limbs and for providing the proper variation of resistance to movement in all positions when the distal end of the limb is being moved in substantially a straight line between the extended and retracted positions and vice versa, said machine comprising

(1) frame means supporting components of said machine,

(2) a user-actuated lever pivotally supported on said frame means for swinging back and forth movement of one end thereof,

(3) force transfer means supported on said user actuated lever and at a predetermined distance from the pivotal connection of said lever, said force transfer means being adapted to be engaged by the distal end portion of the limb to be exercised to move said one end of said lever back and forth in a predetermined arc of movement, one end of the arc of movement being reached when the limb is in substantially extended position and the other end of the arc of movement being reached when the limb is in substantially retracted position,

(4) a negative profile cam supported for rotation on said frame and having a different radius at different degrees of rotation thereof to provide moment arms of different lengths as said negative profile cam is rotated,

(5) first flexible connector means fixed at one end to a position on said negative profile cam and being connected at its other end to said lever at a position spaced from the pivotal support thereof,

(6) weight means for offering resistance during an exercise, said weight means being adapted for vertical movement on said frame,

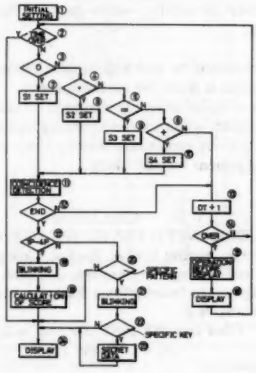
(7) a wheel supported for rotation on said frame and having a uniform radius larger than any radius of said negative profile cam so that the amount of force applied by the user to said force transfer means to raise said weight means is greater than the amount of weight provided by said weight means, said wheel being fixed to rotate with said negative profile cam, and

(8) second flexible connector means fixed at one end to a position on said wheel and being connected at its other end to said weight means, said second flexible connector means being wound onto said wheel to lift said weight means while said first flexible connector means is being unwound from said negative profile cam when said lever is being moved toward one end of said arc of movement, and said second flexible connector means being unwound from said wheel to lower said weight means while said first flexible connector means is being wound onto said negative profile cam when said lever is being moved toward the other end of said arc of movement whereby the proper variation of resistance to movement is provided in all positions when the limb is being moved in substantially a straight line between the extended and retracted positions and vice versa.

4,511,138
GAME CALCULATING APPARATUS

Toshihiko Sumitani, Nara, and Kenichiro Komeda, Gose, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 12, 1982, Ser. No. 407,482
Claims priority, application Japan, Aug. 18, 1981, 56-129866; Aug. 26, 1981, 56-134440
Int. Cl.[3] A63B 71/06
U.S. Cl. 273—1 E 3 Claims



1. A game device for use as a secondary function in an electronic device having a diverse primary function, comprising:

display means for displaying a plurality of characters at a plurality of display positions;

means operatively connected to said display means for sequentially varying the characters displayed at each said display position;

key means operatively connected to said means for varying for selectively stopping said variation of said characters at all said display positions upon actuation thereof;

memory means for storing a reference pattern of characters representative of a possible display therein;

means responsive to actuation of said key means comparing a first signal representative of the patterns displayed on said display means with a second signal representative of said reference pattern stored in said memory means and producing a unique indicia upon determination of a coincidence therebetween wherein said indicia is a code word symbolizing a specific prize to be awarded; and

wherein said unique indicia is separate from score; and

wherein said unique indicia is only outputted on the display, as opposed to being outputted as a hard copy; and

wherein said secondary function includes outputting said code word, and said primary function includes operation of said electronic device for purposes other than displaying said code word.

4,511,139
BASEBALL TRAINING BAT

Harold A. Armstrong, 3919 Ladoga, Long Beach, Calif. 90808

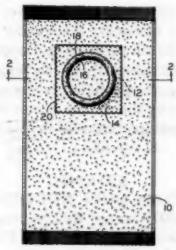
Filed Feb. 13, 1984, Ser. No. 579,271
Int. Cl.[3] A63B 69/40
U.S. Cl. 273—26 B 2 Claims

1. A baseball training bat comprising an elongated bat body of conventional shape having a handle portion and a ball contacting portion disposed remote from said handle portion, said ball contacting portion being divided into a free end section and a handle section, said sections being joined by a hinge means for pivotal movement relative to one another, such that one end of said free end section will pivot into alignment with one end of said handle section to make contact with said handle section and emit an audible sound when said bat is swung by a user.

4,511,140
BOWLING BALL RETAINER-TOWEL DEVICE

Robert L. Wenger, 206 W. Michigan St., LaGrange, Ind. 46761

Filed Jul. 7, 1983, Ser. No. 512,202
Int. Cl.[3] A63D 5/00
U.S. Cl. 273—54 B 6 Claims



1. A bowling ball retainer-towel device comprising an extended uninterrupted area, panel-like towel of flexible fabric that lies in a flat plane when laid on a flat surface, and a loop-shaped annular embossment lying in the plane of said fabric having "towel flexibility" and of a fixed diameter smaller than a bowling ball being secured to said towel and spaced inwardly of the edges thereof, said embossment being relatively rigid thereby to serve as a raised obstruction to restrain rolling of a bowling ball placed thereinside while said fabric with said embossment is laid flat on a flat surface.

4,511,141
AUTOMATIC APPARATUS FOR POSITIONING FOOTBALLS FOR KICKING

Samuel R. Dumas, 215 Oakhurst St., El Dorado, Ark. 71730

Division of Ser. No. 273,344, Jun. 15, 1981, Pat. No. 4,424,969.
This application Dec. 6, 1983, Ser. No. 558,512
Int. Cl.[3] A63B 67/00
U.S. Cl. 273—55 B 11 Claims

1. A football support stand for automatically positioning a football for subsequent kicking, the stand comprising:

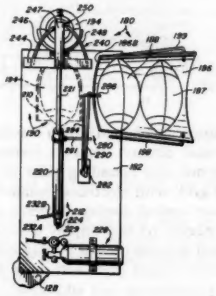
base means adapted to be disposed upon a supporting surface;

hopper means inclined with respect to said base means for containing a plurality of footballs to be kicked, the hopper means having an output mouth towards which footballs roll;

set up means for receiving footballs from said hopper means mouth and operable to properly position them for subsequent kicking, said set up means comprising:

receptor plate means operationally adjacent said hopper means for serially receiving footballs and then moving them to a generally vertically upright position suitable for kicking;

means for moving said receptor plate means between a horizontal football receiving position wherein said plate



means may receive a football exiting said hopper means mouth and a vertical position wherein the football is oriented in a position suitable for subsequent kicking; and,

guide arm means for temporarily maintaining footballs in said position suitable for kicking after they have been appropriately positioned by said receptor plate means;

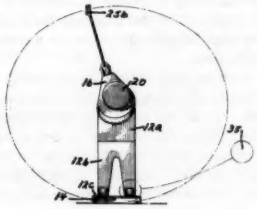
gate means for preventing the output of footballs from said hopper means mouth when said receptor plate means is disposed in said vertical position; and,

gate trigger means for opening said gate means whereby to load said receptor plate means.

4,511,142
GOLF TRAINING DEVICE

Robert L. Pote, Jr., Mt. Vernon, Ind., assignor to Tempo, Inc., Mount Vernon, Ind.

Filed May 9, 1983, Ser. No. 493,019
Int. Cl.[3] A63F 7/06; A63B 69/36
U.S. Cl. 273—87.4 8 Claims

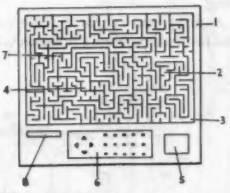


1. A golf training device comprising a miniaturized player model defined by a base supported upstanding body frame, a body portion rotatably mounted on said base supported upstanding body frame, a golf club selectively secured to said rotatable body portion simulating full swing golfing shots, and a resilient layer underlying and affixed to said base supported upstanding body frame, where the selective compression of portions of said resilient layer serves a player model weight distribution and shifting relationship.

4,511,143
ELECTRONIC MAZE GAME

Mithra M. K. V. Sankrithi, 417 Bellevue Way SE. #400, Bellevue, Wash. 98004

Filed Aug. 20, 1982, Ser. No. 409,937
Int. Cl.³ A63F 9/06
U.S. Cl. 273—153 R 26 Claims

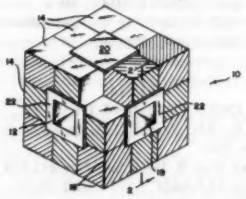


1. A game apparatus comprising a display board;
discrete optical display elements forming a grid on said display board and bounding sides of interstitial blocks with said grid, with electronic means for selectively displaying said optical display elements so that a maze pattern is displayed on said display board;
and additional discrete optical display elements in the interstitial blocks of said grid, with user operable means for selectively displaying said additional optical display elements.

4,511,144
MULTI-CUBE PUZZLE

Patrick A. Roberts, 9348 Cherry Hill Rd., #624, College Park, Md. 20740

Filed Sep. 28, 1982, Ser. No. 425,539
Int. Cl.³ A63F 9/08
U.S. Cl. 273—153 S 13 Claims

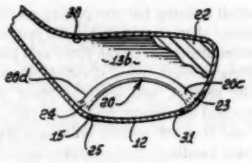


1. A multi-cube puzzle comprising an array of individual smaller cubes defining together a cubical array forming a substantially larger cube the exposed faces of which larger cube have an edge length equivalent to a multiple of that of said individual cubes,
each said face of said cubical array being defined by an annular series of cubes in square form excepting a single void cube zone in said array together defining the edges of the cubical array, and thereby to define six square annuli on said cubical array each having a square central open area, the open areas centrally of said cubical array defining three transverse intersecting passages through said array having a six-pointed rectilinear star-like form,
said open areas having therein a six-legged central core upon which and against which said individual cubes are retained and partake of sliding movement, thereby to permit translation of any one cube from any position in said cubical array to any other position therein by digital manipulation and movement thereof along an exposed face through said single void cube zone, and,
separate end retainer means carried by each leg of said core and engaging a portion of an exposed face of each said smaller cube thereby to retain said individual cubes in grouped array for sliding movement while permitting free digital access to each face annulus.

4,511,145
REINFORCED HOLLOW METAL GOLF CLUB HEAD

Glenn H. Schmidt, 1857 Los Encinos, Glendale, Calif. 91208

Filed Jul. 18, 1983, Ser. No. 514,975
Int. Cl.³ A63B 53/04
U.S. Cl. 273—167 H 7 Claims

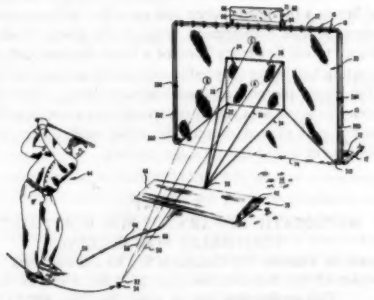


1. In a hollow metallic golf club head having a ball striking front wall, a top wall, a bottom wall, and longitudinally spaced toe and heel walls, the improvement comprising
(a) said front wall having a front side, and a rear side exposed to the hollow interior of the head,
(b) and a metallic ridge in the form of an arch integral with said front wall and extending longitudinally and downwardly adjacent said front wall from a central region of the front wall and adjacent said rear side thereof to transfer ball impact loading to said toe and heel walls,
(c) said ridge having the form of a rib with opposite end portions, and upper, rear and lower surfaces each of which is arched upwardly throughout the major lengthwise extent of the rib between said opposite end portions, said opposite end portions approaching said toe and heel walls increasing substantially in forward and rearward thickness, whereby the rib has compound arching configuration for impact load transfer to said toe and heel walls.

4,511,146
PRACTICE GOLF NET DEVICE

Owen D. Windall, 1007 Oswego Rd., Napersville, Ill. 60540

Filed Jul. 26, 1983, Ser. No. 517,264
Int. Cl.³ A63B 57/00
U.S. Cl. 273—181 J 15 Claims



1. A practice golf net device comprising a fabric-like screen, a frame, means to drape said screen from said frame in substantially a vertical plane, at least one shroud line, one end of each of said at least one shroud line being disposed secured to said flexible screen the other end of each of said at least one shroud line being coupled together at a point, a plate, a disc, said disc journaled for rotation on a lateral surface of said plate, a hingable plate, one end of said hingable plate hingably secured to

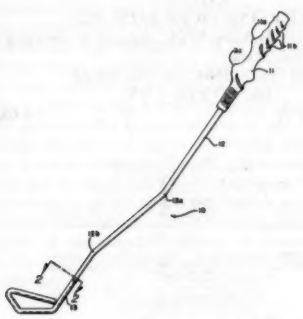
said disc, the other end of said hingable plate being disposed free to move upwardly and outwardly from an uppermost surface of said disc into one of a plurality of positions, means to slidably secure a first cable along a surface of said hingable plate, one end of said first cable being secured to said each other end of said at least one shroud line at said point, means to releasingly clampingly engage said first cable against slidable motion, means to bias said free end of said hingable plate from every said one of said plurality of upward and outward positions, an indicating lever, said indicating lever pivotably secured to said disc, means to angularly position said indicating lever at selected locations reflecting said diverse upward and outward location of said free end of said hingable plate, means to resettably reposition said angular position assumed by said disc, said means to resettably reposition including means to rotationally position said disc at one of a plurality of selected angles of rotation dependent upon said one end of said at least one shroud line being displaced a distance away from a position attained by said one end of said at least one shroud line when said first cable has not been slidably positioned in clamping engagement by said means to releasingly clampingly engage said first cable, a pointer, said pointer secured along the length of said first cable, means to resettably retain said pointer at a selected position when said screen is impacted by a golf ball, said means to resettably retain said pointer including visual access means to visually access said pointer and a distance depicting scale disposed on said plate, a second cable, said second cable being coupled to said hingable plate, said second cable being coupled to said indicating lever, said visual access means including means to visually access said pointer and said distance depicting scale.

4,511,147

GOLF SWING TRAINING CLUB

William A. Olsen, 594 W. 2050 North, West Bountiful, Utah 84087

Filed Aug. 3, 1983, Ser. No. 520,060
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—193 A **11 Claims**



1. A golf swing trainer comprising, a grip means for accommodating a golfer's hands closed therearound; a shaft having an end of an upper substantially straight portion thereof fitted to said grip means and a lower portion, said lower portion including a substantially straight portion positioned along an axis spaced from said upper portion and substantially parallel to the axis of said upper portion, said upper and lower portions being connected by a substantially straight portion connected to said upper and lower portions at substantially equal angles; and weighted head secured to the lower end of said lower shaft portion and extending outwardly therefrom, which head has an open center area.

4,511,148

SCOOP AND CUP DEVICE FOR PLAYING A GAME

Homer C. Amos, Palm Springs, Calif.; Joseph C. Benedyk, Highland Park; Carl E. Scheie, Libertyville, both of Ill., and William R. McGlove, Albuquerque, N. Mex., assignors to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 158,128, Jun. 10, 1980, abandoned.
This application Mar. 31, 1982, Ser. No. 363,964
The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.
Int. Cl.³ A63B *59/00, 71/02*
U.S. Cl. 273—326 **87 Claims**

1. A ball catching and throwing device for playing a ball game comprising:

(a) an elongated scoop means having inner and outer surfaces, a distal end, a proximal end and a pair of outwardly and upwardly facing edges between the distal end and the proximal end thereof;

(b) a curvilinear-shaped ball cup means having inner and outer surfaces, an open edge and a closed edge, the closed edge secured to the proximal end of the scoop;

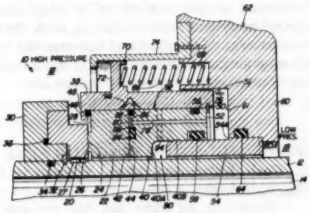
(c) the scoop means having an elongated central first axis extending from the distal end to the proximal end, a portion of the scoop means along the first axis having a portion thereof in the configuration of a segment of a hyperbolic spiral, the spiral having a formula in which the polar coordinates $R\theta$ equal a constant C ($R\theta = C$) and wherein the values of R range from 1.5 to 60 centimeters and the values of the constant C range from 10 to 30 centimeter-radians when θ is measured in radians.

4,511,149

MECHANICAL SEAL WITH CYLINDRICAL BALANCE SLEEVE

Winfred J. Wiese, Whittier, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 29, 1983, Ser. No. 537,229
Int. Cl.³ F16J *15/38, 15/48*
U.S. Cl. 277—3 **12 Claims**



1. A mechanical seal assembly for substantially preventing the flow of a fluid along a rotatable shaft from a high pressure region to a lower pressure region, said seal assembly being associated with a housing and comprising:

a pair of relatively rotatable seal rings having opposed seal faces, one seal ring being connected to said shaft and the other seal ring being connected to said housing and spaced from said shaft;

a back-up ring for one of said seal rings and spaced from said shaft, said back-up ring being constructed of a material

having a different modulus of elasticity than said one of said seal rings, said one of said seal rings and said back-up ring having annular mating faces;

a first zone communicating with said lower pressure region and bounded in part by the inner surfaces of said one seal ring and said back-up ring;

a generally cylindrical member closely surrounding said one of said seal rings and said back-up ring and exposed at its outer surface to high pressure in said high pressure region, said member forming with the outer surfaces of said one of said seal rings and said back-up ring a second zone sealed from high pressure fluid; and

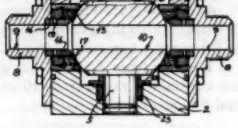
passage means communicating said first zone and said second zone so that low pressure fluid exists on the inner and outer surfaces of said one seal ring and said back-up ring and thus substantially prevent distortion of said one of said seal rings and said back-up ring because of pressure differentials between their inner and outer surfaces.

4,511,150

DEVICE PROVIDING AN EFFECTIVE SEAL FOR A SPHERICAL ROTARY SLIDE VALVE

Gabriel Séguenot, Neuilly-sur-Seine, France, assignor to Societe Nouvelle Auxim (Societe Anonyme), Saint-Etienne, France

Filed Jun. 7, 1983, Ser. No. 501,981
Claims priority, application France, Jun. 7, 1982, 82 10085
Int. Cl.³ F16K *5/06, 5/20;* **F16J** *15/48*
U.S. Cl. 277—12 **12 Claims**



1. In a sealing device for a valve with a spherical rotary valve member of the type in which an effective seal between a valve body and the rotary valve member is insured by means arranged within the body around ducts provided in said body for passage of the fluid each include an annular gasket capable of being pressed against the rotary valve member by means reacting to the hydrostatic pressure, the improvement wherein the means reacting to the hydrostatic pressure are constituted by at least one ring of a material elastically deformable under pressure, located at the bottom of a blind annular recess formed in said body and communicating with the corresponding duct for passage of the fluid and between the bottom of the recess and engaging and pressed against the annular gasket to form a continuous sealing assembly therewith.

4,511,151

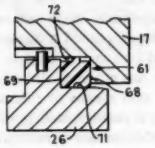
ONE-PIECE MOUNTING RING FOR SEAL INSERT

Thomas E. Cook, Kalamazoo, Mich., assignor to Durametallic Corporation, Kalamazoo, Mich.

Filed Aug. 30, 1983, Ser. No. 527,898
Int. Cl.³ F16J *15/38*
U.S. Cl. 277—92 **9 Claims**

1. In a mechanical seal construction for creating a sealed relationship between a rotatable shaft and a surrounding stuffing box structure, including a rotatable seal ring surrounding and nonrotatably connected to said shaft, a nonrotatable seal ring surrounding said shaft and nonrotatably connected to said stuffing box structure, said seal rings having axially opposed annular end faces disposed in abutting and relative rotative sliding engagement with one another, and packing ring means creating a sealed engagement between said nonrotatable seal ring and said stuffing box structure, comprising the improvement wherein:

said packing ring means comprises a one-piece packing ring of a substantially rigid plastics material, said packing ring including a main body portion which is of a substantially rectangular cross section and is defined by radially inner and outer annular surfaces joined together by substantially parallel axial end faces which extend substantially perpendicularly therebetween, said packing ring also including a ringlike rib which is integral with and externally surrounds said main body portion and projects radially outwardly from the radially outer annular surface thereof, said rib being disposed substantially midway between said axial end faces and having an axial width which is only a



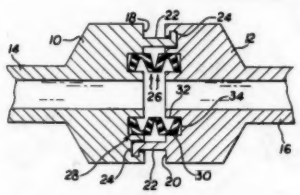
small fraction of the axial width of said main body portion, the radially inner annular surface of said main body portion having a light interference fit with a radially outwardly directed annular surface on said nonrotatable seal ring, the radially outer end of said rib having a light interference fit with a radially inwardly directed surface on said stuffing box structure, the radially outer annular surface of said main body portion being spaced from and free of engagement with said stuffing box structure, one of the axial end faces on said main body portion being sealingly engaged with an opposed surface on said nonrotatable seal ring, and the other axial end face on said main body portion being sealingly engaged with an opposed surface on said stuffing box structure.

4,511,152

SELF-REINFORCED FACE SEAL

Paul J. E. Fournier, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Feb. 8, 1984, Ser. No. 578,137
Int. Cl.³ F16J *15/10*
U.S. Cl. 277—207 A **4 Claims**



1. A self-aligning face seal characterized by its ability to compensate for swelling in an axial direction comprising, an annular molded body of elastomeric material having an axis, a base portion, axially spaced cantilevered lateral portions extending in a common direction from said base portion, each lateral portion including a free end, an outer side surface, an inner surface, and an end surface at the lateral portion free end intersecting said outer and inner surfaces, said lateral portions being axially spaced and said outer side surfaces being obliquely oriented to said body axis whereby the axial spacing between said free ends is greater than the axial dimension of

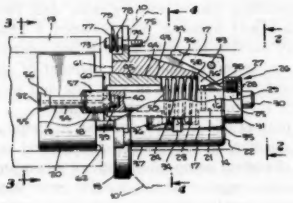
said base portion, and a plurality of circumferentially spaced axially extending bridge segments homogeneously defined of said body material interconnecting said lateral portions radially extending between said base portion and said free ends reinforcing said lateral portions against axial compression, the voids between said segments accommodating swelling of the body material in an axial direction.

4,511,153

CHUCKING ACCESSORY

Lloyd E. Goodrich, Jr., 559 S. Aldenville, Covina, Calif. 91723, and Robert A. Long, 1613 W. Sherway Dr., West Covina, Calif. 92404

Filed Aug. 2, 1982, Ser. No. 404,451
Int. Cl.³ B23B *31/40*
U.S. Cl. 279—2 R **16 Claims**



1. In a chuck accessory for grasping a workpiece which has inwardly facing portions by action originating in the jaw assembly of a substantially conventional chucking means, said chuck accessory comprising a body having a substantially cylindrical portion adapted to be located within said jaw assembly and having a centrally disposed axial bore extending between opposite ends of said body, a fore end, an aft end and an exterior wall, a centrally disposed axially extending draw member mounted in axially slidable relationship with said axial bore, an impeller for said draw member, said impeller having a working end in engagement with said draw member and a laterally exposed actuating end, said impeller being movably mounted on said body between a first position wherein said draw member is in a retracted condition and a second position wherein said draw member is in an extended condition, said impeller when in said second position being adapted to shift said draw member in a direction rearwardly relative to said body, a collet having a first axial guide and a complementary axial guide on said body receptive of said first axial guide, a plurality of jaws on said collet having adjacent expandable ends in circumferentially spaced relationship relative to each other and an expansion plug extending between the adjacent ends of said jaws and said draw member and adapted to effect expansion of said expandable ends in response to a shift in position of said impeller whereby to expand said expandable ends into engagement with the inwardly facing portions of the workpiece.

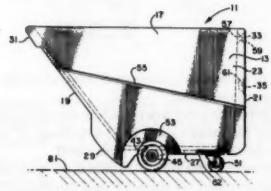
4,511,154

TILT TRUCK

Pasquale C. Daloisio, New Hope, Pa., assignor to Plastech International, Inc., Warminster, Pa.

Filed Dec. 13, 1982, Ser. No. 449,140
Int. Cl.³ B62D *3/08*
U.S. Cl. 280—47.26 **10 Claims**

10. A tilt truck comprising
a double-walled integral tank and frame having outer and inner walls of plastic,
said integral tank and frame being of one-piece construction,
said integral tank and frame having a front tilt wall connected to a back wall by a pair of side walls and having a bottom wall connected to the bottom edges of the front, back and side walls,
said tank and frame having an open top,
the front wall being slanted away from the bottom wall,
a rocker base formed in the lower portion of the front wall,
a tilt stop formed in the upper portion of the front wall,
hand holes formed through the back wall,
roller means mounted on the bottom wall to provide mobility,
said integral tank and frame being made of FDA-approved polyethylene,
said integral tank and frame being of seamless construction,
said roller means comprising a wheel axle seated in the bottom of the bottom wall in an axle groove formed in the bottom wall with a wheel rotatably mounted at each end of the axle.
and at least one swivel caster mounted on the bottom wall and spaced away from the wheel axle to form, with the wheels, at least a three point rolling contact with a floor,
further including a pair of hand holes in the upper portion of the back wall of the integral tank and frame molded through the top portion of the back wall and spaced opposite one another equally distant from a longitudinal center



line of the back wall to facilitate pushing and pulling of the tilt truck,
the hand holes each having an upper surface and a lower surface,
the hand holes each having a depending ridge in the upper surface of the hand hole and an upstanding ridge in the lower surface of the hand hole,
further including a pair of hand holes located in the upper half portion of the back wall of the integral tank and frame,
the hand holes each having an upper surface and a lower surface, and
the hand holes having a groove in the upper surface of each hand hole for easier gripping with the fingers and easier tilting,
further including a pair of stiffening grooves formed in the front wall and bottom wall comprising grooves formed in the outer wall of the double-walled integral tank and frame which contact and support the flat inner wall,
further including at least one stiffener indentation in the bottom wall comprising an indentation formed in the outer wall of the double-walled integral tank and frame that contacts and supports the flat inner wall.

4,511,155

ONE WHEEL TRAILER FOR A TWO-WHEELED VEHICLE

Donald Galloway, Bradenton, Fla., assignor to Verl Fielding, Palmetto, Fla.

Filed Mar. 25, 1983, Ser. No. 478,900
Int. Cl.³ B62D *63/06*
U.S. Cl. 280—204 **20 Claims**

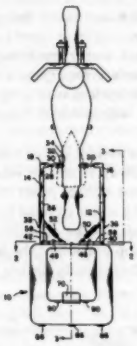
1. A one wheel trailer for a two-wheeled vehicle comprising in combination:
a first and a second arm, each of said arms including a first and a second end, said first end of said first arm being connected one side of the two wheeled vehicle, said first

end of said second arm being connected to the opposite side of the two wheeled vehicle;

a frame plate rigidly secured adjacent said second end of each of said arms;

a container disposed adjacent said frame plate and supported thereby;

a biased suspension plate pivotally connected to said frame plate;



a caster arm swivelably mounted relative to the distal end of said suspension plate;

a damper extending between said caster arm and said suspension plate for moderating the swivelling of said caster arm relative to said suspension plate; and

a wheel rotatably mounted relative to said caster arm enabling said wheel to support said container.

4,511,156

WHEEL SUSPENSION FOR A MOTORCYCLE

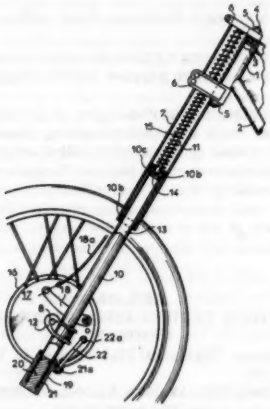
Eric Offenstadt, 41 rue A. Prachay, 95300 Pontoise, France

Filed Apr. 2, 1982, Ser. No. 364,875

Claims priority, application France, Apr. 7, 1981, 81 06966

Int. Cl.³ B62K *25/04*

U.S. Cl. 280—276 **10 Claims**



1. A suspension device for a wheel of a vehicle such as in particular a motorcycle, said suspension device comprising:

a spindle on which the wheel is rotatably mounted,

support means for mounting the suspension device on a frame of the vehicle,

a structure comprising a suspension and shock absorber assembly which is operative along an axis inclined to the vertical and is interposed between and connected to the spindle and the support means,

a first element and a second element, one of said first and second elements being a control element with a cavity portion and the other of said first and second elements being a slidable member slidable in the control element in a direction parallel to said axis, the control element and slidable member defining therebetween a chamber in said cavity portion in said control element, one of said first and second elements being rigid with the wheel spindle and the other of said first and second elements being rigid with the support means,

a brake comprising two elements comprising an element to be braked and a support for brake linings or pads, one of said two brake elements being permanently rigid with the wheel and the other of said two brake elements being mounted to be freely rotatable about the spindle,

a single-acting piston and cylinder unit having a cavity portion and defining therebetween a chamber in said cavity portion in said cylinder and interposed between and connected to said other element of said two brake elements and said one of said first and second elements which is rigid with the wheel spindle,

means putting said cylinder chamber in communication with said chamber in the control element and said means and said chambers being filled with an incompressible fluid,

the slidable member having a solid cross section which is distinctly smaller than the solid cross section of said piston, such that upon braking of said vehicle resulting in compression of said suspension and shock absorber assembly and rearward travel of said wheel, said compression produces relative displacement of said control element and said slidable member which is transmitted by said fluid to cause relative displacement of said piston and cylinder to produce angular movement of said other of said brake elements about said spindle to rotate said one brake element and said wheel, to enable said wheel to roll along the ground during said rearward travel.

4,511,157

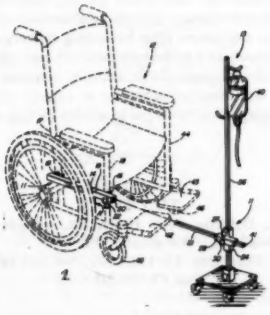
APPARATUS FOR FACILITATING INTRAVENOUS FEEDING DURING TRANSPORTATION OF PATIENT

Chester F. Wilt, Jr., Scottsdale, Ariz., assignor to St. Joseph's Hospital and Medical Center, Phoenix, Ariz.

Filed Jul. 19, 1982, Ser. No. 399,823

Int. Cl.³ A47C *7/62*

U.S. Cl. 280—289 WC **3 Claims**



1. In combination with a portable IV stand and a wheelchair, said IV stand including

a base,

an upstanding elongate pole mounted on said base and adapted to carry an IV bottle, and

ground engaging wheels rotatably mounted on said base, said wheelchair including

a frame,

a seat mounted on said frame,

primary ground engaging wheels rotatably mounted rearwardly on said frame,

secondary ground engaging wheels rotatably mounted forwardly on said frame, said secondary wheels being smaller than said primary wheels, said frame being shaped, contoured and dimensioned such that an individual standing behind said wheelchair can backwardly tilt said wheelchair on said primary wheels to raise said secondary wheels and the forward part of said frame upwardly away from the ground,

substantially rigid means for interconnecting and maintaining said IV stand and said wheelchair in generally fixed spaced relationship with respect to one another when said wheelchair and IV stand are wheeled along the ground, said interconnecting means

(a) being attached at one end to said wheelchair;

(b) being attached at another end to said IV stand;

(c) spanning the distance separating said wheelchair and said IV stand; and,

(d) maintaining said IV stand in front of said wheelchair;

such that when an individual behind said wheelchair

(e) pushes said wheechair said IV stand moves in the same direction of and at the same rate of travel as said wheelchair and is generally maintained in said fixed, spaced relationship with respect to said wheelchair; and,

(f) backwardly tilts said wheelchair to raise said secondary wheels of said wheelchair off of the ground said ground engaging wheels of said portable IV stand are raised from the ground to facilitate passage of said IV stand and said wheelchair over an obstruction on the ground.

4,511,158

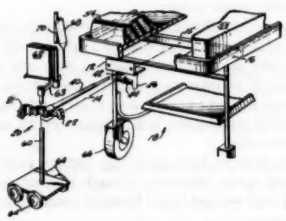
INTRAVENOUS INFUSION POLE ATTACHMENT

Sandor I. Varga, Miami; Richard L. Dougherty, Miami Beach; Donny C. Dandy, Miami, and Willie J. Thomas, Carol City, all of Fla., assignors to Mt. Sinai Medical Center of Greater Miami, Miami Beach, Fla.

Filed Aug. 27, 1982, Ser. No. 412,195

Int. Cl.³ A61G *1/02*

U.S. Cl. 280—292 **13 Claims**



1. A wheeled patient transport device adapted to having a vertically elongated pole removably attached thereto comprising in combination:

an outer frame defining a frame periphery, said frame having at least one support member interiorly disposed relative to said frame periphery;

a bracket rigidly fixed to said support member and defining an aperture therein;

an elongated male member slideably received in said aperture and including at one end clamping means for removably clamping said pole to said patient transport device so that said pole and said patient transport device are moveable as a contiguous unit when clamped one to another, wherein said bracket includes means permitting reciprocal movement of said male member between an extended position wherein said clamping means extends beyond the frame periphery to permit said clamping means to removably clamp said pole and a retracted position wherein said clamping means is retracted interiorly of the frame periphery so as to be substantially hidden.

4,511,159

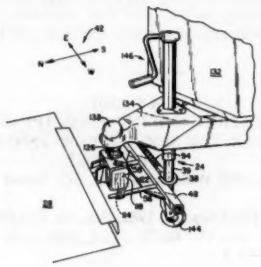
TRAILER HITCH GUIDE ASSEMBLY

Dwen R. Younger, 2181 Lone Oak Ave., Napa, Calif. 94558

Filed Apr. 30, 1984, Ser. No. 605,538

Int. Cl.³ B62D *53/00*

U.S. Cl. 280—477 **18 Claims**



1. An apparatus for vertically aligning respective mating members extending from a towing vehicle and a towed vehicle having a jack shaft, to permit hitching the towed vehicle to the towing vehicle, the apparatus comprising:

(a) a substantially horizontal elongate guide bar;

(b) means for attaching the guide bar at a chosen distance from, and at a selected orientation relative to, the vehicle mating member, the distance chosen according to the distance between the jack shaft and the towed vehicle mating member, and the orientation selected so the guide bar confronts the jack shaft when the towing vehicle is backed into contect with the towed vehicle; and

(c) means for moving the jack shaft along the guide bar to place the respective mating members into vertical alignment.

4,511,160

VEHICLE REAR WHEEL SUSPENSION

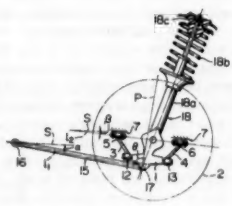
Hitoshi Inoue, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed May 26, 1983, Ser. No. 498,541

Claims priority, application Japan, May 31, 1982, 57-93368

Int. Cl.³ B60G *3/00*

U.S. Cl. 280—701 **4 Claims**



1. A vehicle rear suspension mechanism comprising wheel hub means carrying a vehicle rear wheel for rotation about its axis of rotation, a pair of lateral links extending substantially transversely and having transverse inward ends connected

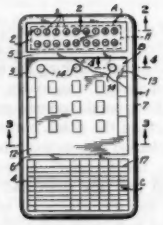
with a longitudinal distance therebetween to vehicle body means for vertical and fore-and-aft swinging movements, said lateral links having transverse outward ends swingably connected with a longitudinal distance therebetween to said wheel hub means, said longitudinal distance between the transverse inward ends of the lateral links being larger than the longitudinal distance between the transverse outward ends, a longitudinal link having one end connected with the vechicle body means and the other end connected with an assembly of the wheel hub means and said lateral links, to transmit a longitudinal force, the improvement comprising a suspension strut assembly which is comprised of damper means and a spring means, said strut assembly having a lower end secured to said wheel hub means and an upper end swingably connected with the vehicle body means, said strut assembly being inclined rearwardly with respect to a line perpendicular to said longitudinal link.

4,511,161

IDENTIFICATION AND CONTROL APPARATUS, FOR EXAMPLE, FOR SERVICE PERSONNEL FOR A RESTAURANT

John Gruner, 3960 Whispering Way, SE., Grand Rapids, Mich. 49506

Filed Sep. 29, 1982, Ser. No. 428,041
Int. Cl.³ B42D *15/00*; A63F *3/00*
U.S. Cl. 283—1 A **7 Claims**



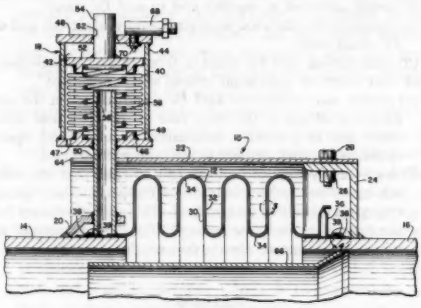
1. Identification and control apparatus for the variable assignment of personnel in selected, variable stations representing subdivided sections of a physical area and for visually indicating said assignment and said stations, said apparatus comprising identification means including a plurality of elements each associated with a respective subject from given personnel, layout means for illustrating on a reduced scale stations corresponding to subdivided sections of a physical area, retaining means for adjustably retaining said elements of said identification means on selected stations of said layout means to associate said elements with said selected stations, correlation means for the correlating of each of said plurality of elements with its respective subject and station, a common support means for the support of said identification means, said layout means and said correlation means in immediate juxtaposition to one another, said support means comprising a base including first, second and third sections, said plurality of elements being removably supported in the first section, said layout means being supported in said second section, and said correlation means being supported in said third section, said retaining means comprising a magnet connected to each of said elements, and a sheet of magnetizable material on said base for magnetically attracting the elements to hold the same in said first section, said layout means including a first sheet on which a planform representation, on reduced scale, of said physical area is placed, and a transparent overlay sheet covering said first sheet and marked to subdivide said planform representative of reduced scale into said stations to form said subdivided sections, means on said base for removably supporting said first sheet and said transparent overlay sheet in superposition, said retaining means further comprising a second sheet of magnetizable material on said base in said second section for magnetically attracting and holding said elements on said overlay sheet in selected and respective sections so that each element representing a respective subject can be removably placed on a selected subdivided section and thereby be physically indicated as being associated with a respective stations, said correlation means comprising means for placement thereon of the name of the subject associated with each of the plurality of elements of the identification means such that when viewing the layout means the physical area will be divided and each station will be associated with a respective subject.

4,511,162

LEAK INDICATING CONDUIT

Robert K. Broyles, Pine Valley, Calif., assignor to Pathway Bellows, Inc., El Cajon, Calif.

Filed Feb. 2, 1983, Ser. No. 463,262
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—93 **16 Claims**



1. A leak indicating conduit for connecting adjacent ends of pipes conveying fluid comprising:

an inner tube;

an outer tube, the inner tube being separated from the outer tube by a first space under a pressure having a predetermined value;

means in continuous communication with said first space for indicating a change of pressure in said first space from said predetermined value;

at least one attachment weld disposed adjacent said conduit and adjacent at least one of said ends of said pipes for attaching said conduit to said at least one of said ends;

at least one annular ring secured by annular welds to said conduit and said at least one of said ends, such that said at least one attachment weld is enclosed by said at least one annular ring;

wherein said at least one ring further partially defines a second space adjacent to said at least one attachment weld, said second space being in communication with said first space.

4,511,163

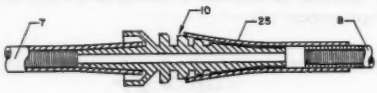
ADAPTABLE TIP TUBING CONNECTOR

Nancy T. Harris, and Leonard C. Harris, both of West Boro, Mass., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Jul. 14, 1982, Ser. No. 398,464
Int. Cl.³ F16L *25/00*
U.S. Cl. 285—177 **5 Claims**

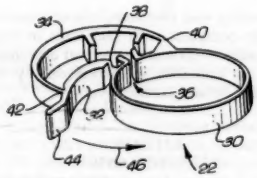
1. An improved adaptable tubing connector comprising a body having a fluid passageway therethrough and with a dietary supply tube connector at one end and an adaptable connector means at the opposite end of the body with the adaptable connector means further comprising a first means and a second means for a selective press-fit connection into and disconnection from the inner bore of an in-dwelling tube insert-

able into a patient for liquid tube feeding wherein the first means for selective connection comprises a sleeve member defining a tip end portion of said passageway, the outer end of the sleeve member projecting from said body, said sleeve member being defined by a wall, said wall having an outer surface which tapers gradually from its smallest diameter at its outer end to its largest diameter at its inner end at a rate of taper which becomes substantially greater at a point midway



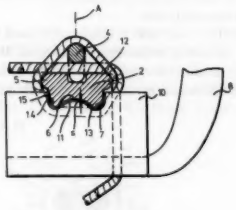
between the outer and inner ends; the second means comprises a middle portion of the connectors length, this middle portion having a multiplicity of stepped flanges which incrementally increase in diameter and spacing therebetween as distance from the tip end increases; the first and second means serving together to adaptably connect firmly via press-fit with tubing of varying size but to do so with ease of connection and disconnection.

4,511,164
TUBE SECURING MECHANISM
Rolf O. Orchard, Manhattan Beach, Calif., assignor to Puritan Bennett Corp., Carlsbad, Calif.
Filed Nov. 30, 1981, Ser. No. 326,126
Int. Cl.³ F16L *33/12*
U.S. Cl. 285—252 **3 Claims**



1. A one-piece plastic tube clamp for use in a respirator breathing circuit, said tube clamp comprising:
- a circular band, continuous except for a single peripheral break to facilitate installation and removal of the clamp;
- a first arcuate portion having one movable end and one end integrally hinged to said band at a first hinge point on one side of the break;
- a second arcuate portion longer than said first arcuate portion and having one end integrally hinged to said band at a second hinge point on the other side of the break and another end integrally hinged to said first arcuate portion at a third hinge point;
- two outwardly extending integral teeth located on said band, one on each side of the break and between the first and second hinge points; and
- two inwardly extending integral teeth on said second arcuate portion, positioned such that, in the closed position, the two outwardly extending teeth are between and in contact with the two inwardly extending teeth, and tensile stress in said band is transmitted to said second arcuate portion through said teeth rather than through the hinge points;
- the clamp having an open position in which said arcuate portions extend out from said band in a relatively unstressed condition, and a closed position in which said arcuate portions are folded into an approximately concentric relationship with said band, and tensile forces in said second arcuate portion act between the second and third hinge points, along a line falling inside the first hinge point, to maintain the closed position by toggle action.

4,511,165
BALER KNOTTING DEVICE WITH COMPLEMENTARY KNOTTER AND STRIPPER
Hubert Prellwitz, Polenz, German Democratic Rep., assignor to VEB Kombinat Fortschritt Landmaschinen, Neustadt, German Democratic Rep.
Filed Jul. 27, 1983, Ser. No. 509,243
Claims priority, application German Democratic Rep., Oct. 11, 1982, 243889
Int. Cl.³ B65H *69/04*
U.S. Cl. 289—8 **3 Claims**



1. A knotting device for a baling machine, the knotting device comprising:
- a pivotal knotting element having a lower jaw and an upper jaw, the jaws being pivoted together and having separable tips, the lower jaw having
  - a lower side formed with a pair of parallel and downwardly projecting ridges defining a downwardly open groove extending to the respective tip, whereby when a loop of a tie is tight around the jaws it spans this groove, and
  - a pair of lateral sides each formed with a longitudinal ridge of cross section decreasing toward the respective tip;
- a stripping element displaceable along the lower jaw and having an upper edge complementary with at least the lower side of the knotting element and having a bump engaging in the ridge thereof; and
- means for displacing the stripping element substantially parallel to and at a fixed spacing from the lower side across the lower jaw and push a loop from the jaws.

4,511,166
HANDLE-OPERATED DOOR LOCK WITH LATCH-OPERATOR OVERRIDE
Lee S. Weinerman, Medina, Ohio, assignor to The Eastern Company, Strongsville, Ohio
Continuation-in-part of Ser. No. 182,690, Aug. 29, 1980, abandoned. This application Jan. 14, 1983, Ser. No. 457,918
Int. Cl.³ E05C *3/30*
U.S. Cl. 292—29 **10 Claims**

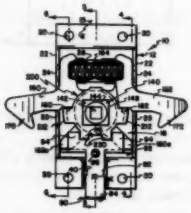
1. A handle-operated door lock, comprising:
- (a) a housing structure having front and rear faces connected by opposed sides, with the front and rear faces each having an opening formed therethrough, and with the openings being aligned along a common axis;
- (b) a pair of hook-shaped rotary latch bolts each projecting from a separate one of the opposed sides of the housing structure;
- (c) inner and outer rotary handles each located near a separate one of the front and rear faces of the housing structure and each having a shaft portion that extends through an associated one of the openings and along the common axis;
- (d) connection means carried within the housing structure

and extending along the common axis for coupling the shaft portions of the rotary handles with the rotary latch bolts, and for cooperating with the housing structure for mounting the shaft portions of the handles for rotation about the common axis such that either of the handles may be rotated about the common axis independently of the other handle to selectively rotate either of the bolts from latched to unlatched positions;

(e) biasing means carried within the housing for biasing the rotary latch bolts toward their latched positions;

(f) latch operator means supported by the housing structure for sliding movement toward and away from the common axis between a locked position wherein the latch operator means functions to prevent the outer handle form rotating either of the bolts, and an unlocked position wherein the latch operator means does not interfere with rotation of either of the handles or with rotation of either of the bolts about the common axis;

(g) latch-operator override means connected to the housing and being movably mounted relative to the housing for moving the latch operator means to its unlocked position in response to rotation of the inner handle so that the



latch-operator override means assures that the latch operator means cannot prevent inner handle rotation about the common axis, and the inner handle can, at all times, be operated to rotate either of the bolts about the common axis from its latched position to its unlatched position;

(h) the housing structure including a pair of metal plates, one of the plates having opposed side walls defining opposite sides of a chamber located between the plates, the side walls each having at least one tab-like projection extending therefrom, the other of the plates having formations configured to receive the tab-like projections in interfitting engagement, the tab-like projections being bent into interfitting engagement with the formations during assembly of the housing structure;

(i) the connection means including a pair of rotary tumblers journaled within the housing structure for rotation about the common axis, each of the tumblers being drivingly connected to a separate one of the inner and outer rotary handles; and,

(j) the latch-operator means being engageable with at least one of the rotary tumblers when the latch operator is in its locked position.

4,511,167

DETACHABLE HOLDER FOR CONTAINERS

Takehiko Kawaguchi, Sakai, Japan, assignor to Taiyo Sanso Kabushiki Kaisha, Osaka, Japan

Filed Jul. 21, 1983, Ser. No. 515,901

Claims priority, application Japan, Mar. 25, 1983, 58-43769[U]; Apr. 4, 1983, 58-50404[U]

Int. Cl.[3] **A47J** *45/10*; **B65D** *23/10*

U.S. Cl. 294—28 **5 Claims**

1. A detachable holder for containers which comprises:

a first pair of bent arms having respective ends connected to each other via a hinge;

a second pair of bent arms having respective ends connected to each other via a second hinge;

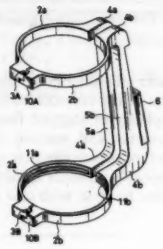
two handle-levers connecting free ends of said first pair of arms with those of said second pair of arms; and,

at least one fixing member engageable with said handle-levers;

the holder wherein:

said handle-levers are capable of being brought into contact with each other or detached by closing or opening of said arms via said hinges;

said arms are capable of being clamped on or released from the container in response to closing or opening of said hinges, respectively;



said two handle-levers each having respectively a rail for engaging with said fixing member in their lengthwise direction, and, said fixing member has grooves to be engaged with said rails on said handle-levers in the lengthwise direction of the member;

at least one of said rails on the handle-levers has a cutaway part; and

fixation for joining said two handle-levers and concurrent clamping the container with said arms or separation of said two handle-levers and concurrent detachment of said arms from the container is carried out by sliding said fixing member on said handle-levers.

4,511,168

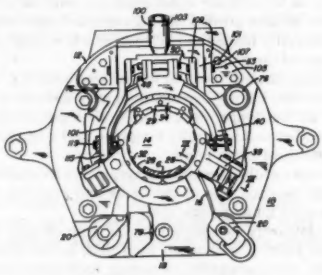
SLIP MECHANISM

Charles W. Haynes, Spring, Tex., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Feb. 7, 1983, Ser. No. 464,521

Int. Cl.[3] **E21B** *19/07*

U.S. Cl. 294—102.2 **12 Claims**



1. A slip mechanism for gripping a conduit of circular cross section comprising:

a body having an internal bore and a split section open to said bore, said split section being at least as large as the outside diameter of said conduit;

a horizontally disposed, vertically movable ring above said body;

a rear slip and two side slips disposed at least partially within

said bore, said rear slip being positioned opposite said split section, said slips each encompassing approximately a 120° arc;

means for articulatingly suspending said slips from said ring, said suspension means for said side slips including means for sliding said side slips in an arcuate path concentric with said bore upon raising of said ring, said sliding in an arcuate path being a distance sufficient to expose said split section; and

means for selectively raising and lowering said ring.

4,511,169

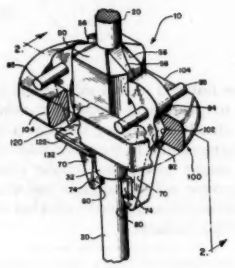
SELF LOCKING AND UNLOCKING ELEVATOR ASSEMBLY

Clyde A. Willis, Wichita Falls, Tex., assignor to Walker-Neer Manufacturing Co., Inc., Wichita Falls, Tex.

Filed Sep. 30, 1982, Ser. No. 430,943

Int. Cl.³ B66C *1/64*

U.S. Cl. 294—116 **24 Claims**



1. An elevator for drill pipe, comprising:

at least two jaws, each jaw having a clamping surface shaped to support a length of pipe;

pivot means for urging the clamping surfaces of the jaws into contact with a length of pipe to be elevated, when the ends of the jaws distant from the clamping surfaces are urged away from the pipe;

elevator suspension and jaw activating means for suspending the elevator, for urging the ends of the jaws distant from the clamping surfaces away from the pipe, and in conjunction with the pivot means, for urging the clamping surfaces into contact with the pipe, when the elevator suspension and jaw activating means and the pipe are urged away from each other; and

release means for urging the clamping surfaces away from the pipe when the elevator suspension and jaw activating means and the pipe are urged toward each other.

4,511,170

AERODYNAMIC DEVICE FOR LAND VEHICLES

Mithra M. K. V. Sankrithi, 417 Bellevue Way SE., #400, Bellevue, Wash. 98004

Filed Jul. 23, 1982, Ser. No. 401,335

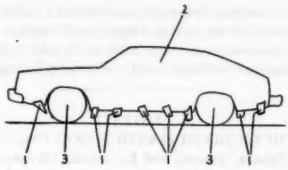
Int. Cl.³ B62D *35/00*; B64C *1/26*

U.S. Cl. 296—1 S **10 Claims**

1. In a wheel supported land vehicle having an even number of supporting wheels located substantially symmetrically on either side of said wheel supported land vehicle's plane of symmetry, the improvement comprising:

an aerodynamic device which comprises more than two winglets arranged substantially in tandem on each side of said wheel supported land vehicle;

wherein said winglets project from body surface regions on either side of said wheel supported land vehicle, which body surface regions are located inclusively between the outer portions of the lower body surface of said wheel supported land vehicle and the lower portions of the side body surfaces of said wheel supported land vehicle;



and wherein a majority of said winglets have negative angles of incidence and positive anhedral angles.

4,511,171

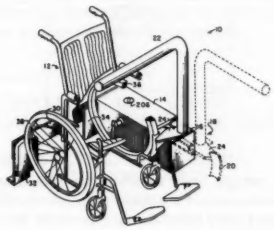
WHEELCHAIR RESTRAINT

Lee B. Petersen, #7 Birch Ct., Danville, Calif. 94526

Filed Jun. 15, 1982, Ser. No. 388,521

Int. Cl.³ B60N *1/02*; B60P *3/06*

U.S. Cl. 296—65 R **2 Claims**



1. A wheelchair restraint apparatus comprising

a fixed bumper adapted to engage one end of a wheelchair,

a movable restraining bumper adapted to engage the other end of a wheelchair and hold said wheelchair in compression between said fixed restraining bumper and said movable retraining bumper, and

means for moving said movable restraining bumper toward and away from said fixed bumper comprising

a fixed actuator base support located adjacent one side of said wheelchair,

a movable base support connected to said actuator base support and adapted to be moved in a horizontal linear motion generally parallel to said wheelchair,

means connected to said movable base support for rotating said movable restraining bumper from a position away from the fixed restraining bumper to a position generally parallel to said fixed bumper, said movable restraining bumper being pivotally connected to said movable base support,

means for moving said movable base support and parallel disposed movable restraining bumper toward said fixed restraining bumper in a straight line to engage said wheelchair and hold said wheelchair in compression between said movable restraining bumper and said fixed restraining bumper, said means comprising

a linear motion actuator,

a bumper pivot arm pivotally connected to said movable base support,

a first linkage member connecting said bumper pivot arm to said movable restraining bumper,

a second linkage member connecting said pivot arm to said linear motion actuator, and

means for locking said means for moving said parallel dis-

posed movable restraining bumper in a fixed position comprising

a ratchet attached to said fixed actuator base support,

a rocker arm pawl pivotally connected to said movable base support and adapted to engage said ratchet and hold said wheelchair in compression between said movable restraining bumper and said fixed restraining bumper.

4,511,172

VEHICLE DOOR HANDLE SEALING SYSTEM

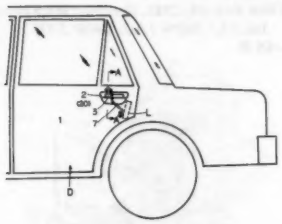
Masaaki Tabata, Susono, and Katsuyuki Miyabayashi, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jun. 16, 1983, Ser. No. 504,949

Claims priority, application Japan, Nov. 1, 1982, 57-166070[U]

Int. Cl.³ B60J *5/04*

U.S. Cl. 296—146 **9 Claims**



1. A vehicle body structure for preventing entry of water into the interior of a vehicle door, comprising:

an outer door panel forming an outer face of a vehicle door and having an opening therein;

a door handle case mounted in said opening in the outer door panel;

a door handle member having an outer portion substantially parallel to said outer door panel and an inner portion substantially perpendicular to said outer portion, said inner portion including a first arm mounted at a first end of said outer portion of said door handle member and a second arm mounted at an opposite second end of said outer portion of said door handle member, and said first and said second arms are pivotally mounted in said door handle case, thereby manipulating the door to open and close, whereby a first aperture exists between the outer door panel and the first arm member and a second aperture exists between the outer door panel and the second arm member; and

a first sealing member is installed between the outer door panel and the first arm and a second sealing member is installed between the outer door panel and the second arm, such that each sealing member extends parallel to each respective arm and each sealing member substantially encapsulates a bottom portion of each respective arm, thereby covering said aperture and preventing water from flowing into the interior of said door.

4,511,173

PICKUP TRUCK CAP HAVING A ROLL-AWAY DOOR

Harold G. Wentzel, Union, Mich., assignor to Uneek Cap and Door, Inc., Elkhart, Ind.

Filed Apr. 28, 1983, Ser. No. 489,582

Int. Cl.³ B60P *3/32*

U.S. Cl. 296—156 **9 Claims**

1. A cap for a pickup truck which comprises:

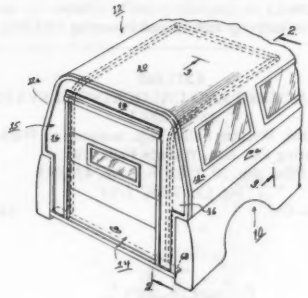
side portions arranged to form an extension of the side walls of the box of said truck,

a cover portion spanning said side portions,

a top cross-panel extending from one side portion to the other and depending from the cover portion,

side panels which project inwardly from said side portions and extend downwardly from said top cross-panel, forming a rectangular opening,

a sectional overhead door,



track means fastened to said side panels and to said cover, adapted to guide said sectional overhead door from a position closely underlying said cover portion to a position in juxtaposition to the inner sides of said panels, and

said track means comprising tubular channels having apposed, narrow, rolling surfaces and said overhead door having rollers affixed thereto adapted to roll on said apposed rolling surfaces.

4,511,174

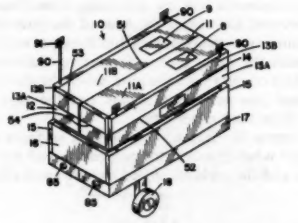
CAMPING AND RECREATION TRAILER

Mathew Walker, 297 N. Western, St. Paul, Minn. 55103

Continuation-in-part of Ser. No. 308,466, Oct. 5, 1981, abandoned. This application May 2, 1983, Ser. No. 490,726

Int. Cl.³ B60P *3/34*

U.S. Cl. 296—173 **7 Claims**



1. A camping and recreation trailer comprising:

a main frame, said main frame having an underside and a top surface for forming a picnic table, said main frame comprises two sections pivotally hinged to each other;

a pair of wheel mechanisms connected to said main frame, said wheel mechanism detachably mounted to said underside of said main frame to permit removal of said wheel assemblies;

a pair of removable sides on said camping and recreation trailer;

said removable sides having folding legs attached thereto to permit said removable sides to be removed from said camping and recreation trailer to form benches when said folding legs are extended;

a sun and rain canopy mounted to said main frame;

means mounted to said sun and rain canopy and said main

frame for raising and lowering said sun and rain canopy from said main frame;

a tongue for towing said camping and recreation trailer, said tongue pivotally connected to said main frame, said tongue operable for folding underneath said camping and recreation trailer to form a stable support leg for said camping and recreation trailer;

a garbage container mounted on said main frame;

a barbecue unit mounted on said main frame; and

an opening in said main frame of said camping and recreation trailer to permit ice fishing from said camping and recreation trailer.

4,511,175

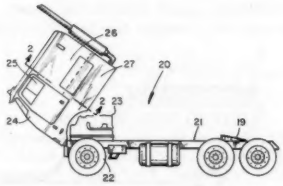
TRUCK CAB WITH REAR COMPARTMENT AND ENGINE HOUSING

Thomas C. Gellenbeck, Indianapolis, Ind., assignor to Team Cruiser Conversion Co., Inc., Indianapolis, Ind.

Filed Oct. 13, 1983, Ser. No. 541,782

Int. Cl.³ B62D *33/06*

U.S. Cl. 296—190 **11 Claims**



1. A truck having a fifth wheel for removably connecting a large payload trailer thereto comprising:

a frame with an engine mounted thereon;

a tiltable cab moveably mounted on said frame and extending over said engine, said cab including a driver and passenger front seat portion and a rear compartment;

an inverted U-shaped cover mounted to said cab and extending adjacent to separate said engine from said front seat portion, said cover including a top wall with a most forward edge positioned within said rear compartment and substantially rearward of said front seat portion;

a rear compartment floor extending between said front seat portion and said cover and extending over said engine substantially lower in elevation than said top wall forming a walkway to support an upright person thereatop between said front seat portion and said cover; and,

a closure wall fastened to said floor and extending interiorly within and fastened to said cover.

4,511,176

VEHICLE BODY FLOOR CONSTRUCTION OF MOTOR VEHICLE

Hiroyuki Watanabe, and Yasushi Tanaka, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 1, 1982, Ser. No. 383,964

Claims priority, application Japan, Jun. 12, 1981, 56-90277; Sep. 9, 1981, 56-141888

Int. Cl.³ B62D *21/00*

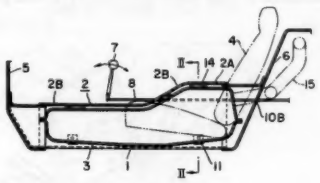
U.S. Cl. 296—204 **7 Claims**

1. A vehicle body floor construction for a motor vehicle, comprising:

a vehicle floor panel having an upwardly projecting central portion in the widthwise direction of the vehicle, the central portion of said floor panel projecting upwardly to form a tunnel disposed in a longitudinal direction of the vehicle; and

a fuel tank disposed in said tunnel, said fuel tank having an upper surface within said tunnel which progressively increases in height within said tunnel toward a rear portion of a vehicle;

an upper surface of said upwardly projecting central portion forming said tunnel being located on the interior of a vehicle compartment, said upper surface of said upwardly projecting central portion and said upper surface of said fuel tank defining a closed cross-sectional area therebe-



tween, a shift linkage coupled to a speed-change control lever mounted within the compartment, said shift linkage extending through said closed cross-sectional area, said upper surface of said upwardly projecting central portion being constructed and arranged to form an armrest for an occupant extending from an inner side of a seat within the compartment toward the rear of the vehicle.

4,511,177

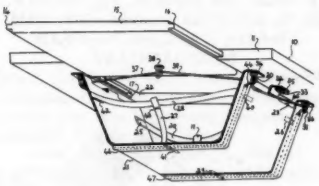
CONVENIENT BABY CHAIR

Daniel J. O'Sullivan, 116-40 Park La. S., Kew Gardens, N.Y. 11418

Filed Jul. 30, 1982, Ser. No. 403,919

Int. Cl.³ A47B *83/02*

U.S. Cl. 297—136 **4 Claims**



1. A convenient baby chair, comprising a slidable leaf cut from a table top and retractable therefrom, an opening in said table top appearing when said slidable leaf is retracted therefrom, s collapsible seating structure secured to said table top underneath said opening, a means for pulling said seating structure close to the underside of said table top when said slidable leaf is fully inserted into said table top and for permitting said seating structure to be occupied by an infant or child when said slidable leaf is fully retracted from said table top, front and rear openings in said seating structure which permit the infant or child to be seated facing at or away from said table top, and front and rear restraining straps and leg dividers mounted across said front and rear openings.

4,511,178

QUICK RELEASE MOUNTING FOR SEAT BACK TRAY TABLE

Edward J. Brennan, Litchfield, Conn., assignor to PTC Aerospace Inc., Bantam, Conn.

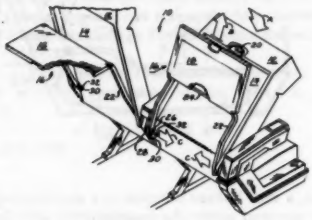
Filed Dec. 16, 1982, Ser. No. 450,400

Int. Cl.³ A47B *83/02*

U.S. Cl. 297—146 **13 Claims**

1. A seat back mounted tray table asembly for a transport vehicle passenger seat which may be quickly assembled not

disassembled, without tools, from a mounted relationship with a pair of seat frame members located adjacent the opposed side edges of a seat back member by authorized persons but protected form removal by passengers, said tray table assembly including a tray table and having a pair of spaced, downwardly extending legs pivoted thereto, said legs being joined by a torsion tube but deflectable by authorized persons toward each other at their lower ends; a pair of short, axially aligned pivot studs mounted to said seat frame members, said pair of pivot



studs forming a pivot axis for said pair of legs and cooperating with a pivot aperture or opening formed in each of said legs to mount said legs; stop means on said seat frame members for limiting the outward pivotal movement of said legs away from said seat back when said tray table is deployed from its generally vertical storage position in the seat back to a generally horizontal use position; and means mounted to at least one of said seat frame and seat back members for preventing unauthorized disassembly of said legs from said pair of pivot studs.

4,511,179

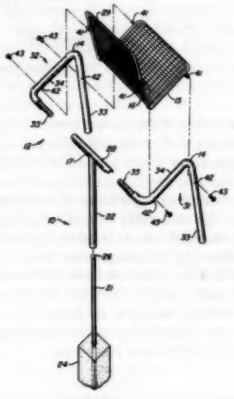
THEFT-PROOF SELECTIVELY POSITIONABLE OUTDOOR CHAIR

Lawrence E. Green, 1859 Powell St., and William R. Morrish, 544 Union St., both of San Francisco, Calif. 94133

Filed May 7, 1982, Ser. No. 375,928

Int. Cl.³ A47C *1/12*

U.S. Cl. 297—349 **7 Claims**



1. A modular assembly of component parts capable of being assembled into a selectively positionable chair for permanent installation outdoors, said assembly comprising:

a rear leg member comprising an elongate first member adapted at one end to be fixed in the ground and a second member mounted on said first member for pivotal movement about the longitudinal axis thereof, said second member being provided with a cross member perpendicular thereto defining a horizontal pivot axis in the assembled chair;

right and left members, each having a first end portion formed to provide a front leg to the assembled chair, an intermediate portion formed to provide an arm rest of the assembled chair, and a second end portion, each said second end portion and said cross member being adapted for rotary mounting so that said right and left members pivot about said horizontal pivot axis in the assembled chair; and

a seat member and a back member adapted to be secured to said right and left members.

4,511,180

HEADREST IN PASSENGER CARS

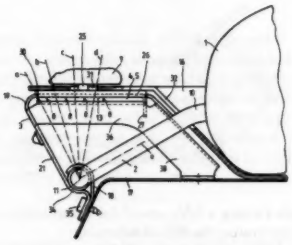
Gersmann Klaus, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,929

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138851

Int. Cl.³ A47C *1/10*

U.S. Cl. 297—408 **4 Claims**



1. A headrest for vehicles comprising:

mounting means for carrying headrest padding, and being pivotable relative to the vehicle body in the zone of a backrest about a substantially horizontal pivoting axis extending generally at right angles to the longitudinal axis of the vehicle, from a forward position determined by a stop,

means for releasably locking the mounting means into at least one rearward position wherein the center of gravity of the headrest mass lies spaced from the pivoting axis of the mounting means above said pivoting axis, and from which the mounting means can be pivoted into said forward position under an inertial force acting on the headrest above a predetermined minimum deceleration of the vehicle,

the means for releasably locking including a spring-loaded detent means having a directional ratchet means including several directional stop means for locking the mounting means in place in its forward pivoting position and in several rearward pivoting positions against rearward pivoting, and

a spring means engaging the mounting means for pretensioning the mounting means toward the rearward position.

4,511,181

TILT BED VERTICALLY STORABLE UTILITY TRAILER

Raymond G. Schantz, Marine, Ill., assignor to Schantz & Sons, Inc., Marine, Ill.

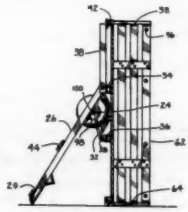
Filed Mar. 7, 1983, Ser. No. 472,588

Int. Cl.³ B60P *1/04*

U.S. Cl. 298—5 **6 Claims**

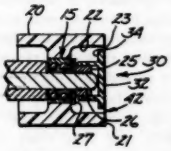
1. A vehicular trailer having a bed and means supporting wheels for said trailer, an elongated tongue having pivot means pivotally connecting a rear end of the tongue to the trailer underneath said bed, a forward end of said tongue having hitch

means for connecting the trailer to a vehicle, said trailer bed being tiltable about said pivot means in a trailer hitched position to a substantially ground engaging position for a rear end of said bed, said trailer being supportable in a storing position upon a ground support surface with the bed in a substatially vertical position and the rear end engaging the ground and said



tongue being pivotable about said pivot means to engage the forward end of the tongue in supporting relation with the ground, an axle supported underneath said bed rearwardly of said pivot means and locking means provided to secure an intermediate portion of said tongue to the axle in the storing position.

4,511,182
SKATE WHEEL COVER
David H. Birnbaum, 49 Vienna, San Francisco, Calif. 94112
Filed Jul. 21, 1982, Ser. No. 400,475
Int. Cl.³ B60B *7/02, 7/06;* **A63C** *7/26*
U.S. Cl. 301—37 P **3 Claims**

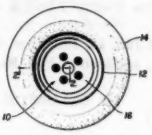


1. In a skate wheel having a recessed wheel well which has a periphery, said skate wheel being rotatably supported on an axle by a bearing means, said axle having an externally threaded end projecting into said wheel well, an internally threaded nut being threadably engaged with said threaded end of said axle to secure said skate wheel to said axle, said nut being disposed within said wheel well and having an external surface, an improvement comprising:

a cover member having a front surface and a rear surface, said rear surface of said cover member having a central region, said cover member having an outer circumference; and

means for securing said cover member to said axle, said securing means comprising a tubular member having a first end and a second end, said first end being rigidly secured to said central region of said rear surface so that said tubular member projects from said rear surface of said cover member, said second end being oppositely disposed from said first end and having a circular cross section and a cyllindrical interior surface, said interior surface of said second end of said tubular member being resilient and deforming outwardly when inserted over said external surface of said nut to frictionally secure said cover member to said nut, said outer circumference of said cover member being smaller than said periphery of said wheel well, said cover member being positioned within said wheel well with an airspace being provided between said circumference of said cover member and said periphery of said wheel well, said cover member and said tubular member comprising a plastic one piece unit.

4,511,183
STEEL WHEEL WITH DECORATIVE COVER
Martin A. Spiegel, and Franklin D. Roberts, both of Compton, Calif., assignors to Mr. Gasket Company, Cleveland, Ohio
Filed Jul. 11, 1983, Ser. No. 512,771
Int. Cl.³ B60B *7/02, 7/06*
U.S. Cl. 301—37 S **18 Claims**



15. A wheel assembly for a vehicle, comprising:

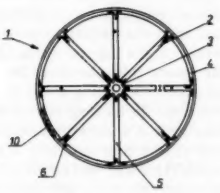
a conventional steel wheel having a rim with a well, a wheel center joined to said well and supporting said rim, said wheel center having a central hub aperture surrounded by a plurality of stud holes for mounting the wheel on the studs of a vehicle axle hub;

a metal cover extending over said wheel center only and having a plurality of stud apertures therein which register with said stud holes of said wheel center;

the outer periphery of said cover extending around and into the junction between said wheel center and said rim and engaging the wheel at said junction; and

said cover being spaced from said wheel center between said outer periphery of the cover and said stud apertures of the cover, whereby said cover is clamped to said wheel center in use by the studs and nuts by which the wheel is mounted on the vehicle.

4,511,184
PLASTIC WHEEL
Dieter Schauf, Leichlingen; Klaus Protoschill; Karl Oberbach, both of Bergisch-Gladbach, and Hans-Werner Depcik, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany
Filed Aug. 17, 1982, Ser. No. 408,762
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1981, 3134249
Int. Cl.³ B60B *5/02*
U.S. Cl. 301—63 PW **1 Claim**



1. A process for producing an injection molded unitary wheel having an even number of spokes interconnecting a rim and hub, the process comprising the steps of providing a wheel mold having rim and hub forming portions and an even number of spoke forming portions, locating one injection point in each of some of the spoke forming portions of the mold, separating the spoke forming portions of the mold having injection points from each other by an odd number of intermediary spoke forming mold portions without injection points, and injecting a melt stream into each of the injection points

whereby all of the streams meet and coalesce in the intermediary spoke forming mold portions.

4,511,185

BRAKE PRESSURE REGULATOR FOR AN HYDRAULIC VEHICLE BRAKING SYSTEM

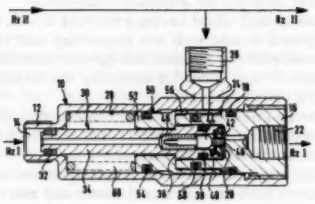
Uwe Wloczyk, Koblenz, Fed. Rep. of Germany, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Jun. 16, 1983, Ser. No. 504,879

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222798

Int. Cl.³ B60T *8/26*

U.S. Cl. 303—6 C **3 Claims**



1. A brake pressure regulator for an hydraulic vehicle braking system, comprising a housing (**10**)

a first inlet chamber (**14**) and an outlet chamber (**20**) in fluid connection with each other in said housing and being connectable into a first brake circuit (HzI-RzI), and a second inlet chamber (**24**) in said housing for connection to a second brake circuit (HzII-RzII),

the first inlet chamber (**14**) and the outlet chamber (**20**) being defined by piston surfaces of different sizes of a stepped piston (**30**),

the stepped piston (**30**) controlling a valve (**40**) in said fluid connection between the first inlet chamber (**14**) and the outlet chamber (**20**),

said stepped piston (**30**) being acted on by the biassing force of spring means urging said stepped piston towards a first position in which the valve (**40**) leaves said fluid connection open,

the second inlet chamber (**24**) being defined by an annular control piston (**50**) having a cylindrical inner surface and being acted on by the biassing force of spring means in the same direction as the stepped piston (**30**) against the pressure in the second inlet chamber (**24**),

said stepped piston (**30**) being aided by the control piston (**50**) to overcome the biassing force acting on said stepped piston to move it to a second position at which the valve (**40**) closes when a first switching pressure (p1) in both brake circuits (HzI-RzI, HzII-RzII) is surpassed,

the stepped piston (**30**) being movable to said second position only at a second, higher switching pressure (p2) if because of pressure failure in the second brake circuit (HzII-RzII), said stepped piston is not aided by the control piston in overcoming the biassing force acting on said stepped piston, characterized in that said cylindrical inner surface of

the control piston (**50**) surrounds the stepped piston (**30**) without contacting the same and said surface is sealed radially inwardly against a plug (**16**) which is inserted in the housing (**10**) and which in turn sealingly surrounds said stepped piston (**30**).

4,511,186

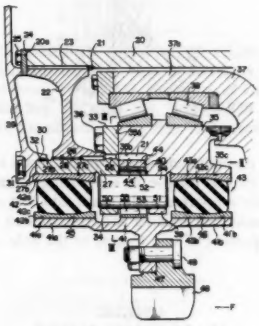
SPROCKET WHEEL ASSEMBLY OF ENDLESS TRACK-TYPE VEHICLES

Tatsuya Sasamoto, Tokyo, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 24, 1983, Ser. No. 497,646

Int. Cl.³ B62D *55/12*

U.S. Cl. 305—57 **5 Claims**



1. A sprocket wheel assembly of a crawler vehicle including a drive shaft and a final reduction gear casing, comprising:

a first inner tube mounted on said drive shaft, said first inner tube having formed therein at one end thereof a flange extending radially inwardly and outwardly, said flange having formed therein a plurality of first holes in the outwardly extending flange portion;

a second inner tube rotatably mounted on said final drive gear casing, said second inner tube being fixedly connected with said first inner tube and having formed therein a flange extending radially outwardly, the flange of said second inner tube having formed therein a plurality of second holes each being in register with said respective first holes;

an outer tube disposed so as to extend outer circumferences of said first and second inner tubes, said outer tube having a first cylindrical section formed at one end thereof, a second cylindrical section formed at the other end thereof, a protrusion extending radially inwardly from an intermediate section thereof, and a flange extending radially outwardly from the intermediate section thereof, said protrusion being adapted to be inserted between the flanges of said first and second inner tubes and having formed therein a plurality of third holes each being in register with said respective first and second holes, diameter of said third holes being made larger than that of said first and second holes;

a first elastic annular block unit interposed between said first inner tube and the first cylindrical section of said outer tube;

a second elastic annular block unit interposed between said second inner tube and the second cylindrical section of said outer tube;

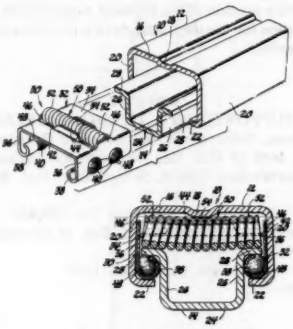
a sprocket wheel fixedly monted to the flange of said outer tube; and

a plurality of pins each inserted into said respective first and second holes across said third holes defining an annular gap between the outer periphery of each of said pins and the inner periphery of each of said third holes.

4,511,187
BEARING ASSEMBLY FOR SEAT SLIDE

Richard W. A. Rees, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1983, Ser. No. 555,129
Int. Cl.³ A47B *88/14*; A47C *1/023*; F16C *21/00*; F16M *13/00*
U.S. Cl. 308—3.8 **4 Claims**



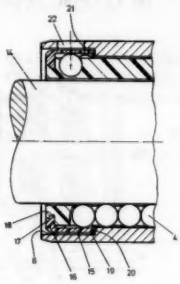
1. In a seat slide for supporting an occupant seat and including a pair of generally U-shaped track members, one track member including a base wall, a pair of side walls and a terminal flange extending from each of the side walls, the other track member including a base wall opposed to the one base wall, a pair of side walls, each located in opposed spaced relationship to a respective side wall of the one track member, and a terminal flange extending from each of the side walls and located in opposed spaced relationship to a respective terminal flange of the one track member, and bearing means located between the opposed respective terminal flanges, a bearing assembly for the track members comprising, a flexible elongate member including a center axle portion and roller end portions, means rotatably locating the elongate member transversely of the track members between the base wall of the one track member and the terminal flanges of the other track member, rib means on the base wall of the one track member engageable with the center axle portion of the elongate member to bow the elongate member and engage the roller end portions thereof with the terminal flanges of the other track member, the bowed elongate member biasing said track members apart relative to each other and engaging the bearing means with the opposed respective terminal flanges to locate the track members, the elongate member, and the bearing means in rattle free relationship when the seat is unoccupied, occupancy of the seat shifting the one track member relative to the other track member and engaging the base wall of the one track member with the roller end portions of the elongate member whereby such end portions act as rotatable support and spacing rollers between the track members and support the track members and seated occupant for relative adjustment.

4,511,188
BALL BEARING FOR LENGTHWISE AND TURNING MOVEMENT

Lothar Walter, Schweinfurt, and Walter Reith, Bad Bocklet, both of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 3, 1983, Ser. No. 491,050
Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216440
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **6 Claims**

1. In a ball bearing for longitudinal and rotational movement on a shaft, and having circumferentially distributed endless rows of balls, the bearing being comprised of an outer sleeve with axially extending concentric cylindrical races in the bore of the outer sleeve for loaded balls, the races terminating at both ends in annular radial turnaround recesses in the bore of the outer sleeve, and a sleeve-shaped cage rotatably positioned in the bore of the outer sleeve, the cage having axially extending guides for the loaded and unloaded balls, the guides being interconnected in pairs by radially outwardly open semi-circular turnaround guides, so that axially extending return recesses

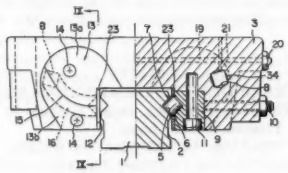


for the unloaded balls of each row are formed between each pair of cylindrical races for the loaded balls, either in the cylindrical bore of the outer sleeve or on the surface of the cylindrical shaft, the improvement wherein the cage is held at its two ends by an end ring mounted on the cage and having an outer section radially covering the turnaround guides of the cage.

4,511,189
ENDLESS LINEAR MOVEMENT ROLLER BEARING

Tatsuo Mottate, Mitaka, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,367
Claims priority, application Japan, Jul. 14, 1982, 57-123427
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **1 Claim**



1. A roller bearing for linear movement with endlessly circulating rollers comprising a track rail and a casing linearly movable thereon, said track rail and casing having confronting surfaces having cooperating confronting linear track portions therein, a plurality of bearing rollers in said linear track portions, means in said casing providing a return track portion interconnected with said linear track portions, and a further plurality of said bearing rollers in said return track portion, said bearing rollers endlessly circulating through said linear track portion and said return track portion, said return track portion including a direction changing path which reverses the direction of said rollers in a circular curve, said direction changing path having a projection onto a plane perpendicular to the direction of movement of the bearing rollers which is a circular curve, thus allowing a smooth direction changing movement of the rollers.

4,511,190

KINETIC WHEEL ARRANGEMENT INCORPORATING MAGNETIC BEARINGS, PARTICULARLY FOR STORING ENERGY

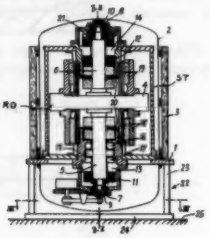
Paul D. Caye, Epone; Patrice C. Jamain, Maule, and Bernard G. Weisser, Limay, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jul. 19, 1983, Ser. No. 515,150

Claims priority, application France, Aug. 19, 1982, 82 14339

Int. Cl.³ F16C *39/06*

U.S. Cl. 308—10 **7 Claims**



1. Kinetic wheel arrangement comprising:

a stator,

a rotor rotating about an axis of rotation Z—Z, defined by said stator,

magnetic bearings formed by cooperating parts respectively connected to the stator and to the rotor in order magnetically to suspend the rotor with respect to the stator,

a suspension system connecting said stator to a high-inertia suport, and wherein said suspension system includes a plurality of elastic blades disposed parallel to one another so that the length, the width, and the thickness of said elastic blades are respectively parallel to a first direction parallel to the axis of rotation Z—Z of the rotor, a second direction V—V the elastic suspension system is disposed between the high-inertia support and the stator, an envelope which encloses the stator and the rotor and base plate which projects outside of said envelope and said suspension system is disposed between a part of the base plate projecting outside of the envelope and said high-inertia support at right angles to the axis or rotation Z—Z of the rotor, and a third direction U—U at right angles to the two preceding directions Z—Z and V—V.

4,511,191

ANTICREEP DEVICE FOR ANNULAR MEMBER

Masayuki Kitamura, Toyonaka, Japan, assignor to Koyo Seike Company Limited, Osaka, Japan

Filed Feb. 14, 1984, Ser. No. 580,453

Int. Cl.³ F16C *27/06*

U.S. Cl. 384—536 **8 Claims**

1. An anticreep device comprising an annular member fittable to a support member and having a circumferential groove formed in its outer periphery eccentrically thereof and including a deep groove portion and a shallow groove portion, and a resilient ring fittable in the circumferential groove and having a protruding portion of a height of projection projectable from the deep groove portion toward the support member and opposite end portions fittable one over the other within the circumferential groove at a position adjacent to the protruding portion to provide a combined thickness larger than the depth of the shallow groove portion, the protruding portion and the opposite end portion being fitted in the deep groove portion with the other portion of the resilient ring fitted in the shallow groove portion for the use of the device to prevent creep of the annular member.

4,511,192

SUPPORT FOR A TENSION ROLLER

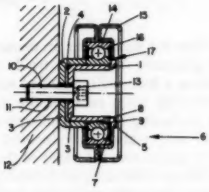
Rüdiger Hans, Niederwerrn, and Manfred Brandenstein, Eussenheim, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 5, 1983, Ser. No. 520,830

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 8222967[U]

Int. Cl.³ F16C *35/06*

U.S. Cl. 384—543 **6 Claims**



1. In a tension roller having a support comprised of two coaxial cup-shaped sleeves mounted with one inside of the other and extending axially in a bearing of a tension roller, the cup-shaped sleeves having an open end and being provided with the mounting holes in their bottoms, and a bearing held by said cup-shaped sleeves, the improvement wherein the cup-shaped sleeves are positioned with one cup-shaped sleeve extending into the other and with their bottoms extending in the same direction, the inner cup-shaped sleeve having a radially outwardly directed flange on its open end axially engaging and holding one axial side of said bearing.

4,511,193

THRUST AND RADIAL BEARING ASSEMBLY

Bela A. Geczy, Orange, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Feb. 10, 1984, Ser. No. 579,150

Int. Cl.³ F16C *19/18*

U.S. Cl. 384—611 **17 Claims**

1. A combined radial and thrust bearing assembly comprising:

a fixed housing;

a rotatable shaft extending through the housing;

a plurality of inner race tracks fixed on the shaft, each pair of adjacent inner race tracks defining an inner portion of the channel;

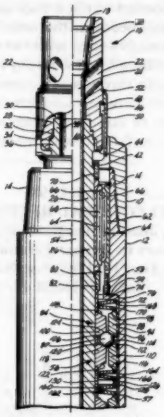
a plurality of outer race tracks mounted in the housing including means for preventing rotation and means for permitting limited axial movement within the the housing, each pair of outer races having a pair of adjacent tracks defining an outer portion of the channel;

a plurality of bearing balls in the channel formed by the inner and outer tracks, said tracks being shaped for transmitting radial and thrust loads via the bearing balls;

upper spring means between an upper pair of outer races and the housing for transmitting an upwardly directed thrust load from the upper pair of outer races to the housing;

a shoulder fixed inside the housing between adjacent pairs of outer races; and

lower spring means between a lower pair of outer races and the shoulder for transmitting an upwardly directed thrust



load from the lower pair of outer races to the shoulder and the housing, the upper and lower springs means being substantially equal for distributing the upwardly directed thrust loads substantially equally between the upper and lower pairs of outer races.

4,511,194

MAGAZINE AND DISC HOLDERS FOR SUPPORTING DISCS IN THE MAGAZINE

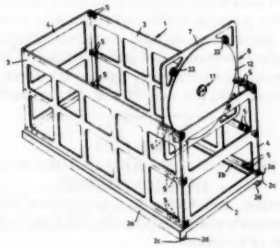
George Park, Preston; Michael J. Smith, Darwen, and Harry Carrington, Blackburn, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,809

Claims priority, application United Kingdom, Mar. 26, 1982, 8208910

Int. Cl.[3] **G11B** *1/02;* **A47B** *81/06*

U.S. Cl. 312—12 **10 Claims**



1. A magazine and a plurality of disc holders for supporting a plurality of centrally apertured discs in the magazine, the magazine comprising a pair of opposed walls which lie in parallel planes and having an open side between said walls through which the disc holders can be inserted in and removed from the magazine, and the disc holders each comprising a rigid plate with attachment means for attaching a centrally apertured disc to one or each side of the plate, the plate having a pair of opposed parallel edges for cooperation with guide means which are provided on the inner sides of said walls of the magazine for guiding the disc holders during their insertion in and removal from the magazine in directions parallel to said edges of the plates of the holders and for supporting the disc holders in the magazine with the plates of the holders lying in spaced parallel planes, and the attachment means of each disc holder being arranged to engage in the central aperture or apertures of the respective disc or discs and being constructed to engage over the edge or edges of the disc or discs surrounding the central aperture or apertures thereof so as to secure the disc or discs to the respective side or sides of the plate of the disc holder.

4,511,195

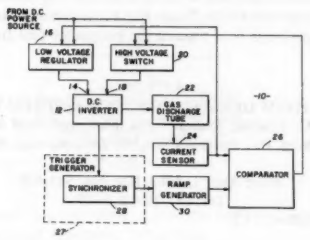
DEVICE FOR STARTING AND OPERATING GAS DISCHARGE TUBES

LeRoy D. Barter, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 30, 1983, Ser. No. 509,904

Int. Cl.[3] **H05B** *37/02;* **G05F** *1/00*

U.S. Cl. 315—308 **4 Claims**



1. A device for supplying starting and running power to a gas discharge tube, comprising:

an inverter having means for generating a low voltage or a high voltage at an output thereof in response to first or second input signals, respectively, the output being connected to the gas discharge tube;

sensing means for providing a sensed output signal proportional to current flow through the gas discharge tube;

means for periodically generating a trigger signal;

driver means responsive to the sensed output signal and the trigger signal for generating a drive signal synchronized with the trigger signal and having a duration inversely related to the magnitude of the current flowing through the gas discharge tube;

switch means for applying the second input signal to the inverter in response to the drive signal; and

means for applying the first input signal to the inverter.

4,511,196

PRINTED CIRCUIT BOARD CONNECTOR WITH INTEGRAL GROUND PLANE

John G. Schuler, La Mesa, and Lowell R. Lingenfelter, La Jolla, both of Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jan. 20, 1984, Ser. No. 572,356

Int. Cl.[3] **H01R** *13/048*

U.S. Cl. 339—14 R **4 Claims**

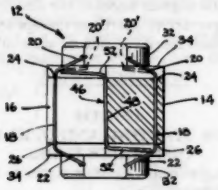
1. A connector having an integral ground plane, comprising:

a generally bar-shaped body formed of an insulating material;

a sheet of conductive material having a central portion extending along the length of and affixed within the body and having a first plurality of spaced-apart finger-like resilient projections extending from and bent across a first side of the body, where the extension and direction of bend of each of the projections is made in accordance with a predetermined pattern; and

a plurality of resilient electrically conductive contacts

spaced apart along the length of the body, each contact having a central portion affixed within the body along a plane generally parallel to the central portion of the conductive sheet, and having a first free end extending from



and bent across the first side of the body so that when a particular first free end is pressed toward the first side, a portion of that first free end is forced into contact with an adjacent one of the finger-like projections if that adjacent projection is bent toward the particular first free end.

4,511,197

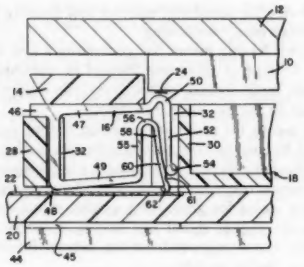
HIGH DENSITY CONTACT ASSEMBLY

Dimitry G. Grabbe, Lisbon Falls, Me., and Iosif Korsunsky, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 1, 1983, Ser. No. 519,429

Int. Cl.³ H01R *9/09*

U.S. Cl. 339—17 CF **4 Claims**



1. An electrical connector for high density usage, comprising:

a chip carrier having a conductive path thereon;

a circuit board having a conductive strip contained thereon;

a housing disposed on said circuit board for receiving said chip carrier thereon;

contact means disposed in said housing said contact means having substantially all of its parts lying in a single plane and having a generally "U"-shaped first portion wherein the legs of said "U"-shape comprise an upper and a lower cantilever member, said upper cantilever member and said lower cantilever member having outer and inner beams attached perpendicularly respectively thereto, said outer beam having an upper contact surface disposed at the point wherein said outer beam and said upper cantilever member meet and having a lower contact surface at the free end of said outer beam, said inner beam comprised of a second generally "U"-shaped member having the first leg as a shunt portion which is perpendicularly attached to the end of the lower cantilever member and the second leg defining an inner arm having an inner arm beam contact surface attached at the end thereof, said inner arm being resiliently biased against the lower contact surface of said outer beam, said contact means being further characterized in that:

said inner and outer beams are in overlapping relationship such that vertical movement of the chip carrier on said upper contact surface results in a wiping motion between said lower contact surface and said second leg of said inner beam and between the inner beam contact surface and said conductive strip with the resulting development of a contact mating force whereby current flows from said conductive path through said upper contact surface, the interface point between said lower contact surface and said inner arm of said inner beam and through said inner beam contact surface to said conductive strip.

4,511,198

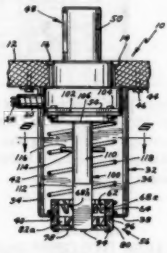
POP-UP ELECTRICAL RECEPTACLE UNIT

Terry L. Mitchell, Jenison, and David H. Hodge, Hopkins, both of Mich., assignors to Dunbar Furniture, Inc., Berne, Ind.

Filed Oct. 12, 1983, Ser. No. 541,206

Int. Cl.³ H01R *13/44*

U.S. Cl. 339—34 **17 Claims**



1. A pop-up electrical receptacle unit comprising a receptacle for receiving therein the prongs of an electrical plug, means constraining said receptacle for rectilinear movement between a retracted position and protracted position, spring means for urging said receptacle from its said retracted position into its said protracted position, manually releaseable means for retaining said receptacle in its said retracted position including a rotary ratchet mechanism, an actuator on said receptacle having a pin thereon for alternately shifting said ratchet mechanism into an interfering position relative to said pin to establish said retracted position when said receptacle is moved from its protracted position to its said retracted position and into a non-interfering position when said receptacle is moved from its retracted position rectilinearly against the force of the spring means to cause said pin to shift said ratchet mechanism.

4,511,199

CARD FRAME WITH CARD GUIDES AND CARDS GUIDED THEREIN

David P. Erlam, and Arthur E. Carr, both of Winchester, England, assignors to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 21, 1983, Ser. No. 486,992

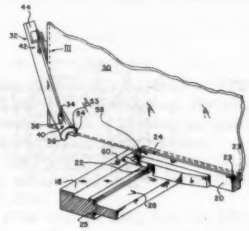
Claims priority, application United Kingdom, Apr. 21, 1982, 8211565

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—45 M **11 Claims**

1. A card frame comprising a number of pairs of vertically spaced card guides for receiving cards provided with plug connectors, each pair of card guides being associated with a socket connector to establish electrical contact, a double-armed lever having a shorter lever arm and a longer lever arm, pivotally mounted on each card by means of a pin at the lower front corner of the card and adapted to be pivoted from out of an initial position oblique to a forward edge of said card, into

a latching position in an abutting relationship with said forward edge of said card, said shorter lever arm terminating in a hook portion and a heel portion, with said hook portion being engageable with a receptacle fixed on the frame, as the card is inserted and the lever is pivoted upward into the latching position, the hook bearing against the receptacle counter to the direction of insertion of the card, said heel portion bearing against a front surface area of the frame as the lever is pushed downward into its initial position and the card is ejected; the



improvement comprising said lever (32) being additionally adjustably mounted by having arcuate slots (36) and a pin (34) of said card (30) movably engaged therein, whereby in an initial position of said lever (32) said pin (34) bears against the upper ends of said slots (36) and in the latching position (FIG. 6) is moved down into the lower portions of said slots (36), and that in said initial position and in said latching position of said lever (32), said pin (34) is located in front of said hooks (54) as viewed in the plug-in direction of said card (30).

4,511,200

ELECTRICAL CONNECTOR HAVING HANDLE-MOUNTED BIFURCATED RESILIENT PIN-ENGAGING ELECTRICAL PLATE

Paul Belokin, Jr., Rte. 4, Box D, Hayward, Wis. 54843

Filed Dec. 2, 1982, Ser. No. 446,241

Int. Cl.³ H01R *33/08, 4/24*

U.S. Cl. 339—50 R **7 Claims**

1. An electrical connector for releasable connection to an electrically conductive pin and adapted to be attached to an uninsulated end of an electrical conductor wire, said connector comprising:

a base member fabricated of electrical insulating material and having a slot extending thereinto from a surface thereof, and having a wire-receiving aperture communicating with said slot; and

an electrically conductive member comprising an inner portion received within said slot in said base member and an outer portion extending from said slot and engageable with said pin,

said inner portion of said electrically conductive member comprising at least one barb frictionally engaged with said base member within said slot and further comprising a wire-engaging aperture engageable with said uninsulated end of an electrical conductor wire extending into said wire-receiving aperture in said base member whereby said uninsulated end of said electrical conductor wire is mechanically trapped between said inner portion of said electrically conductive member and a wall of said slot and is in electrical contact with said electrically conductive member.

4,511,201

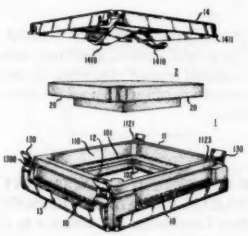
MODULE MOUNTING ASSEMBLY

Paul A. Baker, and Michael G. Strautz, both of Columbus, Ohio, assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 439,389, Nov. 5, 1982, abandoned. This application Jul. 10, 1984, Ser. No. 628,139

Int. Cl.³ H01R *9/09*

U.S. Cl. 339—75 MP **30 Claims**



1. Apparatus for mounting a module with terminals on a circuit board, said apparatus comprising

an assembly (1) for holding the module (2) and interconnecting the terminals (20) thereof with the circuit board (3) characterized in that said assembly comprises

conducting members (10) having opposing first and second contacts (101, 102) for electrically coupling the module terminals with the circuit board,

means (11) having a chamber on one side for receiving the module and a plurality of cavities on the opposite side for recieving said conducting members and aligning each said first contact with a coresponding module terminal,

means (12) for supporting said conducting members and aligning each said second contact with the circuit board,

means (13) for assembling a plurality of said supporting means positioned thereon in combination with said receiving means and said conducting members to form quadrilateral configurations of said first contacts for contacting the module terminals and said second contacts for contacting the circuit board, and

means (14) for engaging said assembling means and clamping the module in said chamber on said receiving means to maintain the module terminals in electrical engagement with said first contacts.

4,511,202

CERAMIC RESONATOR AND A CERAMIC FILTER USING THE SAME

Yoshihiko Kasai, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 17, 1982, Ser. No. 450,790

Claims priority, application Japan, Dec. 29, 1981, 56-213743; Feb. 24, 1982, 57-28430; Apr. 7, 1982, 57-57588

Int. Cl.³ H03H *9/48, 9/205, 9/13, 9/56*

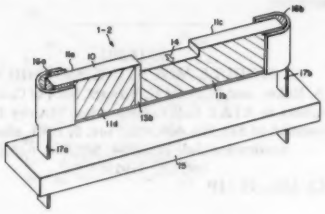
U.S. Cl. 333—189 **13 Claims**

1. A ceramic resonator, comprising:

an elongated piezoelectric ceramic platelet having an indentation transverse to and in the center of the longitudinal direction of said platelet, a polarization in the thickness direction and occurring at least in said indentation, and first and second main surfaces; and

a first metal thin film electrode formed on said first main

surface, a second metal thin film electrode formed on said second main surface, a third metal thin film electrode formed on said first main surface, and a fourth metal thin film electrode formed on said second main surface, said



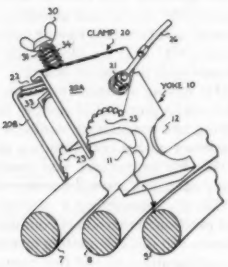
third electrode being electrically isolated from said first electrode and said fourth electrode being electrically isolated from said second electrode by areas of electrical isolation which are offset from each other in said longitudinal direction.

4,511,203

DEVICE FOR PROVIDING ATTACHMENT TO SPACED PARALLEL CABLES OR RODS

Richard H. Eaton, Lynchburg, Va., assignor to General Electric Company, King of Prussia, Pa.

Filed Jul. 25, 1980, Ser. No. 172,183
Int. Cl.³ H01R *11/10*
U.S. Cl. 339—255 P **15 Claims**



1. An improved attaching device for a line trap or device having a plurality of spaced turns or members, said attaching device comprising:

a. an insulating yoke formed of a plate of insulating material having a thickness sufficiently small to be inserted in the space between two adjacent turns or members of a line trap or device, said yoke having a first concave notch bounded by an edge shaped to fit in engagement with a portion of a first of said turns or members, and having a second concave notch bounded by an edge shaped to fit in engagement with a portion of a second of said turns or members adjacent said first turn or member, said notches being opposed and separated by a distance substantially equal to said space between said two adjacent turns or members;

b. a metallic clamp formed of a plate of conductive material mounted on said yoke for pivoting in a plane generally parallel to said yoke plate, said clamp having a concave notch that is bounded by an edge shaped to fit in engagement with a portion of said first turn or member;

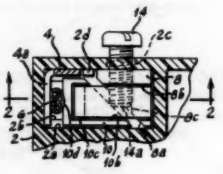
c. and clamping means attached to said yoke for urging said metallic clamp to pivot in said plane and in a direction to cause said edge of said clamp notch toward said edge of said first yoke notch.

4,511,204

RIGHT-ANGLE ELECTRICAL CLAMPING CONNECTOR

Robert L. Glenn, Arab, Ala., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 31, 1983, Ser. No. 462,481
Int. Cl.³ H01R *4/30*
U.S. Cl. 339—263 R **12 Claims**



1. An electrical connector comprising in combination:

means supporting a screw for axial movement in response to rotation thereof, an end of said screw projecting beyond said supporting means;

electrical terminal means fixedly positioned in laterally spaced relation to said screw;

a clamping member disposed adjacent said projecting end of said screw for linear sliding movement at right angles to the axis of said screw, said clamping member having an oblique surface abuttingly engaged by said projecting end of said screw whereby axial movement of said screw drives said clamping member laterally away from the axis of said screw toward said terminal means for clamping an electrical conductor therebetween; and

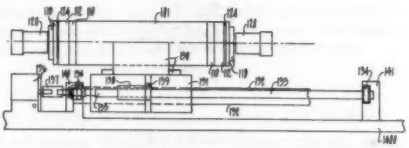
spring means biasing said clamping member oblique surface into engagement with said projecting end of said screw.

4,511,205

SCANNING SYSTEM WHEREIN THE SCANNING BEAM ROTATES AND TRANSLATES

Joseph J. Crane, Woodbridge, Va., assignor to Crossfield Data Systems, Inc., Springfield, Va.

Filed Jun. 2, 1982, Ser. No. 383,928
Int. Cl.³ G02B *27/17*
U.S. Cl. 350—6.1 **4 Claims**



1. In a scanning system of the type having a mirror that both rotates and translates for receiving a beam of light and reflecting it to provide scanning;

a mirror,

a shaft supporting said mirror, said shaft having an axis of rotation, and defining a cavity,

said shaft including turbine means for rotating the shaft, said turbine means receiving air from said cavity and exhausting it to the ambient atmosphere whereby to drive the turbine means and rotate the shaft,

the plane of the mirror being at an angle, different from perpendicular to the axis of said shaft,

a housing for said shaft,

air bearing means supporting said shaft from said housing,

an elongated stationary rail extending parallel to said axis,

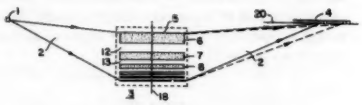
slide means supported by air pressure from said rail,
a lead screw extending parallel to said axis,
said slide means having a lead screw nut connected thereto, said lead screw nut cooperating with said lead screw to move the slide means along the rail when the lead screw is rotated, and
a motor for rotating the lead screw to thereby translate said lead screw nut, said slide, said housing, said shaft, and said mirror, while the shaft and mirror are being rotated by said turbine means,
whereby the mirror both rotates and translates to provide scanning.

4,511,206

LENSLESS SPECTRUM ANALYZER

Lars Thylén, Huddinge; Leif Stensland, Järfälla, and Gunnar Arvidsson, Stockholm, all of Sweden, assignors to Institutet for Optisk Forskning, Stockholm, Sweden

PCT No. PCT/SE82/00137, § 371 Date Dec. 20, 1982, § 102(e) Date Dec. 20, 1982, PCT Pub. No. WO82/03912, PCT Pub. Date Nov. 11, 1982
PCT Filed Apr. 26, 1982, Ser. No. 457,109
Claims priority, application Sweden, Apr. 27, 1981, 8102671
Int. Cl.³ G02B 5/174
U.S. Cl. 350—96.11 **7 Claims**



1. An optical spectrum analyzer comprising:
an optical radiation source;
an optical waveguide made of an electro-optical material and coupled to receive radiation from said optical radiation source;
a plurality of electrodes spaced apart on said waveguide along a line perpendicular to the direction of propagation of said radiation with their lengthwise dimension parallel to said direction of propagation, said electrodes having different widths and different spacing between each other, said radiation having an angular deflection in accordance with optical parameters provided by said electrodes, said electrodes and waveguide comprising an electro-optic deflector for deflecting incident radiation in accordance with an applied electric signal to be analyzed;
a detection matrix disposed in said optical waveguide for receiving said radiation passing through said electro-optical deflector, said detection matrix including a sensing surface disposed along a focal line, which receives radiation from said electro-optical deflector, the position of incident radiation along said focal line being proportional to the frequency of said signal to be analyzed.

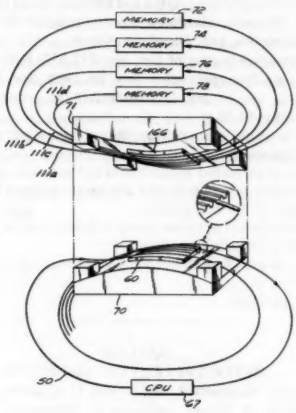
4,511,207

FIBER OPTIC DATA DISTRIBUTOR

Steven A. Newton, Menlo Park, Calif., and John E. Bowers, Milltown, N.J., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 323,038, Nov. 19, 1981. This application Sep. 10, 1982, Ser. No. 416,667
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.15 **14 Claims**

9. A fiber optic data distribution system, comprising;
a first single mode optical fiber;
a plurality of single mode optical fiber segments optically coupled to the first optical fiber, providing an optical path between said first fiber and each of said optical fiber segments to cause a portion of an optical signal transmitted in any of said first fibers and said fiber segments to be coupled between the first optical fiber and at least one of the plurality of optical fiber segments; and
means optically coupled between selected ones of the optical fiber segments for receiving optical signals coupled from the first optical fiber through a first of the selected optical



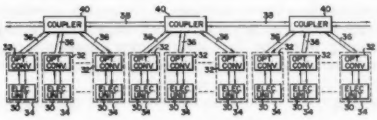
fiber segments and for selectively transmitting optical signals onto a second of the selected optical fiber segments for coupling said selectively transmitted signals onto the first optical fiber, such that a portion of the selectively transmitted optical signals is optically coupled to a third of the selected optical fiber segments.

4,511,208

OPTICAL COMMUNICATION SYSTEM

Takeshi Ozeki, and Toshifumi Tamura, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 5, 1982, Ser. No. 439,547
Claims priority, application Japan, Nov. 26, 1981, 56-189544; Jul. 12, 1982, 57-119931; Jul. 20, 1982, 57-125002; Jul. 28, 1982, 57-130224
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.16 **24 Claims**



1. An optical communication system comprising:
a plurality of stations, each of said stations including means for generating and processing optical signals;
at least two passive optical coupler means, each of said coupler means having a plurality of pairs of ports, at least two of said pairs of ports of each of said coupler means each being connected to one of said stations, respectively, each of said pairs including an input port and an output port, each of said coupler means for causing an optical signal inputted to any one of said input ports to be outputted to all of said output ports except said output port corresponding to said input port receiving said optical signal;
a plurality of optical signal transmission lines interconnecting said passive optical couplers for two-way transfer of said optical signals between said couplers; and
a plurality of optical signal transmission lines connecting

said stations to said coupler means for two-way transfer of said optical signals therebetween.

4,511,209

COMPOSITION HAVING IMPROVED OPTICAL QUALITIES

Bolesh J. Skutnik, Simsbury, Conn., assignor to Ensign-Bickford Industries, Inc., Simsbury, Conn.

Continuation-in-part of Ser. No. 352,050, Feb. 24, 1982, abandoned. This application Jan. 20, 1984, Ser. No. 572,397

Int. Cl.[3] **G02B** *5/172*

U.S. Cl. 350—96.34 **20 Claims**

1. A cladding composition for plastic clad silica optical fibers comprising

a highly fluorinated monofunctional acrylate with a refractive index below 1.38 and constituting more than 50% by weight of the composition,

a polyfunctional acrylate being trifunctional or higher serving as a crosslinking agent,

a mono or polyfunctional thiol that functions as a synergist, and

a photoinitiator.

4,511,210

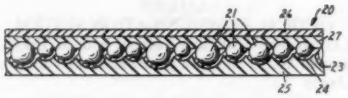
RETROREFLECTIVE SHEETING

Chi F. Tung, Mahtomedi, and James C. Coderre, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 447,615, Dec. 7, 1982, abandoned, which is a division of Ser. No. 275,275, Jun. 19, 1981, Pat. No. 4,367,920, which is a continuation-in-part of Ser. No. 80,434, Oct. 1, 1979, abandoned. This application Sep. 16, 1983, Ser. No. 532,695

Int. Cl.[3] **G02B** *5/128*

U.S. Cl. 350—105 **7 Claims**



1. Retroreflective sheeting comprising: first and second transparent polymeric layers; a monolayer of transparent microspheres embedded in the first layer to, on the average, less than half their diameter, with the second transparent polymeric layer being laminated to the microsphere-covered surface of the first layer, whereby it follows in a substantially constant thickness the curved surfaces of the microspheres protruding from the first layer; and a specularly reflective layer coated on the exposed configured surface of the second layer.

4,511,211

PROJECTION SCREEN ANCHOR

William S. Runyan, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Dec. 13, 1982, Ser. No. 436,470

Int. Cl.[3] **G03B** *21/56*

U.S. Cl. 350—117 **8 Claims**

1. A projection screen comprising:

a screen having spaced-apart lateral edges and opposite upper and lower ends;

support means adapted to be attached to a wall and adapted to support said screen at said lateral edges of said upper end;

a pair of elongated magnetic anchor means pivotally secured to said wall and extending upwardly and outwardly therefrom, said anchor means each having adjustment means thereon for selectively adjusting the angle of said anchor means with respect to the wall;

and said lateral edges of said lower end of said screen each have a metal cap capable of magnetic engagement with said anchor means whereby, upon adjustment of said anchor means to an angle in nonintersecting relation with

the top of the screen, adjustment of said lateral edges of said lower end of the screen longitudinally of said anchor means is operative to adjust the angle of the screen with respect to the wall.

4,511,212

FOCUSSING LENS OPERATING DEVICE

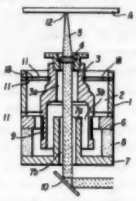
Yoshiharu Tanaka, Omiya, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Kawaguchi, Japan

Filed Sep. 10, 1982, Ser. No. 416,588

Claims priority, application Japan, Sep. 22, 1981, 56-141748[U]

Int. Cl.[3] **G02B** *7/11*

U.S. Cl. 350—255 **16 Claims**



1. A focussing lens operating device for use in an apparatus for reading video and/or audio information recorded in an optionally readable structure on a disc-shaped information carrier comprising:

a frame;

a cylindrical hollow holder held in resilient suspension on said frame;

a focusing lens disposed in the upper portion of said cylindrical hollow holder to converge a light beam into a beam spot on the surface of the information carrier;

an electro-magnetic controlling means arranged near the lower end of said cylindrical hollow holder to move said cylindrical hollow holder upwardly and downwardly in relation to the surface of the information carrier so as to control the size of the beam spot formed on the surface of the information carrier through said focussing lens; and

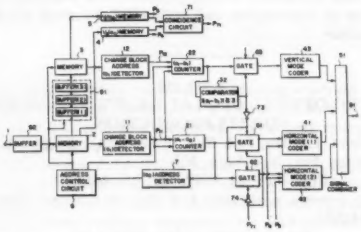
upper and lower supporting means arranged around said cylindrical hollow holder in parallel spaced relationship

with each other to support said cylindrical hollow holder in resilient suspension on said frame, wherein said upper supporting means is constituted by two thin plates arranged around said upper portion of said cylindrical hollow holder, said thin plates being adjacent each other so as to reduce lateral vibrations of said plates by friction between said plates when said holder is displaced for focusing control.

4,511,213
CODING METHOD FOR MULTILEVEL-GRADATED PICTURE SIGNAL

Yasuhiro Yamazaki, Hiratsuka, and Toshiaki Endo, Tanashi, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,186
Claims priority, application Japan, Dec. 24, 1981, 56-212624; Feb. 12, 1982, 57-19767
Int. Cl.³ H04N *1/00*
U.S. Cl. 358—261 **7 Claims**



1. In a coding method for a multilevel-gradated picture signal, comprising the steps of:

segmenting a series of binary codes obtained by processing a multilevel-gradated original picture signal for binary representation, every predetermined number n of picture elements on each scanning line, so as to form blocks respectively capable of assuming values of "0" to "2^n-1"; and

encoding the value of a change block having changed its value and its position on the scanning line so as to be reproduced on the reproducing side;

the improvement characterized by said encoding step performed by the use of the following data:

a_0: address of a block, on a coding line, with which coding starts;

a_1: address of a change block which occurs after the block of the address a_0 on the coding line;

b_1: address of a change block which occurs on a coded reference line after a block of the position just above the block of the address a_0;

b_2: address of a change block which occurs immediately after the block of the address b_1 on the reference line;

$v_1(x)$: value of a block at a position x on the reference line;

$v_2(x)$: value of a block at a position x on the coding line, said encoding step coding the value $V_2(a_0)$ and the address a_1 by coding a relative address of (a_1-b_1) in a Vertical Mode where $v_1(a_0)=v_2(a_0)$ and the relative address of (a_1-b_1) is included in a predetermined range of values;

said encoding step coding the value $v_2(a_0)$ and the address a_1 by coding a relative address of (a_1-a_0) in a Horizontal Mode I where $v_1(a_0)=v_2(a_0)$ and the relative address of (a_1-b_1) exceeds the predetermined range of values; and

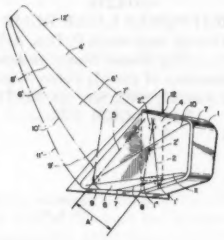
said encoding step coding the value ($v_2(a_0)$ and the address a_1 by coding the value $v_2(a_0)$ and the relative address of (a_1-a_0) in a Horizontal Mode II where the value $v_1(a_0)$ is not equal to $v_2(a_0)$,

said Vertical Mode, said Horizontal Mode I and said Horizontal Mode II being mutually differentiated from one another by said coding.

4,511,214
FAIRING WHICH FOLDS FLAT INDEPENDANTLY OF ITS MIRROR

Wilhelm Klein, Aldingen; Jörg Koske, Weil der Stadt; Siegfried Herzog, Steinenbronn; Hans-Peter Jordan, Schonaich; Wilhelm Bauer; Max Bausch, both of Sindelfingen, and Christian Grabner, Gechingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 21, 1983, Ser. No. 460,112
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1982, 3203371
Int. Cl.³ G02B *5/08*; E04G *3/00*
U.S. Cl. 350—632 **5 Claims**



5. An exterior mirror assembly for vehicles responsive to vehicular collision to lie substantially flat against a vehicle body comprising

a mirror housing,

a fairing,

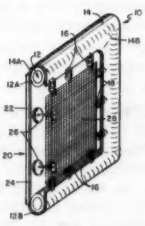
means for causing the fairing to rotate about a first axis in response to vehicular collision, and

means for causing the mirror housing to rotate about a second axis disposed at a substantial angle with respect to the first axis upon vehicular collision.

4,511,215
LIGHTWEIGHT DIAPHRAGM MIRROR MODULE SYSTEM FOR SOLAR COLLECTORS

Barry L. Butler, Golden, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 29, 1983, Ser. No. 490,090
Int. Cl.³ G02B *7/18*
U.S. Cl. 350—295 **13 Claims**



1. A solar energy concentrator comprising:

a frame having a peripheral edge portion thereof and defining a plane;

a semi-rigid membrane positioned on said frame so as to engage the edge portion thereof and extend over the

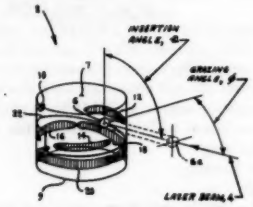
entire frame on a first side of the plane thereof and over a portion of the frame on a second side of the plane thereof;
engaging means securely coupled to the edge portions of said membrane on the second side of the plane of said frame for applying tension to said membrane;
support means coupled to said engaging means for securely positioning said membrane on said frame in a stretched manner;
a flexible optically reflective surface positioned on an outer surface of said membrane on the first side of the plane of said frame; and
adjustable displacement means coupling said support means and an inner surface of said membrane positioned on the first side of the plane of said frame for selectively changing the surface contour of said optically reflective surface and the focusing characteristics thereof with regard to solar radiation incident thereon.

4,511,216

HIGH POWER LASER DUMP

Michael S. Hsu, Lincoln, and James P. Hsu, Arlington, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 23, 1983, Ser. No. 525,755
Int. Cl.³ G02B *5/20*
U.S. Cl. 350—311 **7 Claims**



1. A high power laser dump comprising:
a metallic body having a cylindrical cavity,
said cavity having closed top and bottom surfaces,
said cavity having a specularly reflective coating formed in a first zone thereof and an energy absorbing coating formed in a second zone thereof,
a hole formed on the side wall of said cylindrical cavity,
means for directing a laser beam through said hole and into said cavity at a grazing angle of less than 90 degrees,
said grazing angle being the angle between the center ray of said laser beam and the tangent of the circular cross section of said cylindrical cavity at the point of entry of said laser beam, and
means for directing said laser beam through said hole into said cavity at an insertion angle of less than 90 degrees,
said insertion angle being defined as the angle between the center ray of said laser beam and the longitudinal axis of said cylindrical cavity.

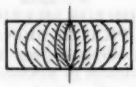
4,511,217

CURVED ELECTRODE PATTERN IN A LIQUID CRYSTAL COLOR DISPLAY CELL

Toshiaki Takamatsu, Nara, and Keisaku Nonomura, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 108,825, Dec. 31, 1979, abandoned, which is a continuation of Ser. No. 829,421, Aug. 31, 1977, abandoned. This application Jan. 26, 1984, Ser. No. 574,194
Claims priority, application Japan, Sep. 7, 1976, 51-120840
Int. Cl.³ G02F *1/13*
U.S. Cl. 350—336 **4 Claims**

1. In a liquid crystal display cell having two substrate means, a plurality of electrode members formed on at least one of said substrate means for display purposes, spacer members positioned between said two substrate means, and a liquid crystal composition filled between said two substrate means, said liquid crystal display cell when having no liquid crystal composition filled between said two substrate means exhibiting characteristic curved shapes of interference fringes due to differences in thickness of said cell across the area of said cell, said curved shapes collectively defining a characteristic configuration of interference fringes across said area, the improvement comprising:



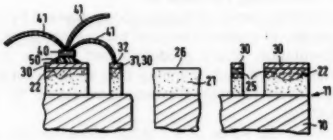
said electrode members being formed on one of said substrate means and being arranged in a generally curved pattern, said curved pattern being substantially symmetrical about and concave to a center line such that an improved uniformity of color indication is provided a segment of the display cell subtended by each electrode member.

4,511,218

ELECTRO-OPTICAL DISPLAY DEVICE AND METHOD FOR ITS PRODUCTION

Bernd Fritz, Lauffen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Nov. 12, 1982, Ser. No. 441,049
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151557
Int. Cl.³ G02F *1/133;* C25F *1/00*
U.S. Cl. 350—356 **4 Claims**



1. An electro-optical display device comprising:
a substrate;
a layer disposed on said substrate, said layer comprising a semi-conductive metal oxide which at the intersection of said substrate and said layer is 100% oxide;
a metallic coating disposed on and adhered to said layer;
wherein the elemental metal content of said layer adjacent said substrate is less than the elemental metal content thereof adjacent said coating and wherein the last one-fifth to one-tenth thickness of said layer on the side thereof adjacent said coating is of 100% elemental metal content; and,
a plurality of electrical leads respectively bonded to selected portions of said metallic coating.

4,511,219

KALMAN FILTER PREPROCESSOR

Michael K. Giles, and Robert B. Rogers, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

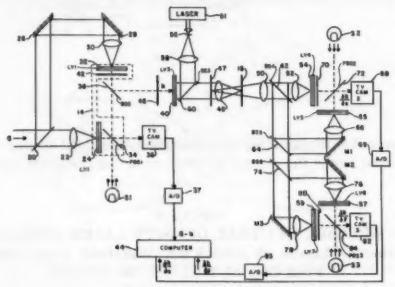
Filed Jun. 15, 1982, Ser. No. 388,574
Int. Cl.³ G02B *27/28;* G02F *1/01*
U.S. Cl. 350—388 **11 Claims**

1. An optical signal preprocessing apparatus for use with a computer employing an extended Kalman filter algorithm, said apparatus comprising:

time averaging means for operating on a source of time varying images to compose an average reference time signal;

subtraction means for subtracting said reference image signal from said source of images, on a continuous basis, to produce a resultant subtraction function image,

first differentiating means for producing a first difference image approximation of a first numbered partial derivative of said reference image signal with respect to a first image dimension,



second differentiating means for producing a second difference image approximation of a second numbered partial derivative of said reference image signal with respect to a second image dimension;

first, second and third optical to electrical signal transducer means for converting said resultant subtraction function image, and said first and second difference image approximations into electrical signals for use with said computer.

4,511,220

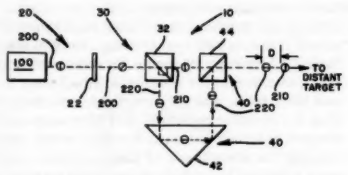
LASER TARGET SPECKLE ELIMINATOR

Charles N. Scully, San Juan Capistrano, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 23, 1982, Ser. No. 452,601

Int. Cl.³ G02B *27/48*

U.S. Cl. 350—403 **4 Claims**



1. A laser target speckle eliminator for use with a linearly polarized laser light beam emitted by a laser having a known coherence length, wherein said laser light beam is polarized vertically, said speckle eliminator comprising:

a. means for rotating said vertically polarized laser light beam 45 degrees, with this means disposed in optical alignment with said emitted laser light beam;

b. means for splitting said rotated laser light beam into two orthogonally polarized components of equal intensity, wherein one component is vertically polarized and the other component is horizontally polarized, and wherein this means is in optical alignment with said means for rotating said vertically polarized laser light beam 45 degrees; and

c. means for recombining said two components of said split and rotated laser light beam such that said components are coincident and have a light path difference which exceeds the coherence length of said laser, wherein this means is in optical alignment with said means for splitting said rotated laser light beam;

whereby two coincident beams result that are orthogonally polarized, that are not coherent with each other, and that have an optical path difference which exceeds said known coherence length of said laser; and

thereby said two beams cannot cause speckle.

4,511,221

REFLEX ZOOM LENS HAVING APERTURE SCALE

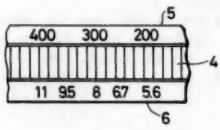
Shinsuke Komoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1982, Ser. No. 451,914

Claims priority, application Japan, Dec. 25, 1981, 56-198671[U]

Int. Cl.³ G02B *7/10*

U.S. Cl. 350—423 **8 Claims**



1. A reflex zoom lens, comprising in combination, a reflection-type optical system in which the full-aperture F number changes with focal length, an aperture scale including aperture indications, and a focal length scale including focal length indications, said aperture scale and said focal length scale being fixed relative to one another whereby said focal length indications and said aperture indications are fixedly juxtaposed.

4,511,222

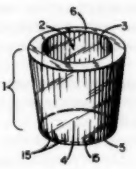
INSPECTION PERISCOPE

Marvin A. Biren, Chestnut Hill, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation of Ser. No. 118,415, Feb. 4, 1980, abandoned. This application Mar. 19, 1982, Ser. No. 359,916

Int. Cl.³ G02B *23/08*

U.S. Cl. 350—441 **10 Claims**



1. An inspection lens for viewing a circumferentially disposed region within an internal, confined area of a structure of the type having inner and outer coaxial surfaces that form a narrow cylindrical passage, said lens comprising:

an optically transparent tubular hollow cylinder having a central aperture therethrough surrounded by an inner sidewall, an outer sidewall, and first and second generally annular end surfaces;

said cylinder being elongate in the direction parallel to said inner sidewall and said outer sidewall;

said cylinder having a tapered outer wall to provide a thinning towards the end of the cylinder having said first annular end surface to permit a portion of said hollow cylinder having said first annular end surface to fit to varying depths between the inner and outer surfaces of said structure while a further portion of said hollow cylin-

der having said second annular end surface projects beyond said cylinder passage;

said first annular end surface providing a focusing and magnifying function, said first annular end surface comprising a lens having in cross-section a curved, sloping optical surface extending between the inner and outer sidewalls for reflecting and focusing an image of said circumferentially disposed region at a predetermined distance from said first annular end surface through said transparent hollow cylinder toward said second annular surface;

said second annular surface including an optical surface permitting focused viewing of said reflected image therethrough.

4,511,223

TELECENTRIC VARIABLE POWER ILLUMINATION SYSTEM

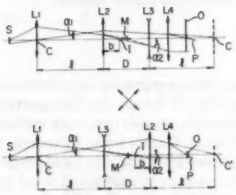
Hideo Hirose, Kawaguchi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 14, 1982, Ser. No. 388,200

Claims priority, application Japan, Jun. 19, 1981, 56-93729

Int. Cl.³ G02B *21/06*

U.S. Cl. 350—523 **10 Claims**



1. A telecentric variable power illumination system comprising:

a light source;

a converging first unit for forming an image of said light source;

a converging second unit disposed between said converging first unit and an object surface to be illuminated;

a diverging third unit disposed between said converging first unit and the object surface;

a converging fourth unit disposed between said divergent third unit and the object surface, said converging fourth unit having a focal point coincident with the position of the light source image formed by said converging first unit;

said light source image by said converging first unit being formed between said converging second unit and said diverging third unit,

the converging second unit and the diverging third unit being interchangeable in position with each other; and

means for reversibly interchanging the positions of said converging second unit and said diverging third unit while maintaining the telecentricity and while maintaining said light source image between said converging second unit and said diverging third unit.

4,511,224

MICROTOME WITH SPECIMEN ILLUMINATION SYSTEM

Helmuth Sitte, Seefeld/Tirol, Austria; Terry W. Cooper, Milton Keynes, Great Britain, and Heinrich Kleber, Vienna, Austria, assignors to C. Reichert Optische Werke, AG, Vienna, Austria

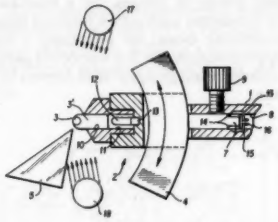
Filed Aug. 1, 1983, Ser. No. 519,283

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 32244449; Sep. 29, 1982, 3235951.

Int. Cl.³ G02B *21/06;* B23Q *3/00*

U.S. Cl. 350—523 **10 Claims**

1. A microtome having a specimen carrier which can be moved relative to a knife, the specimen carrier being provided with a clamping aperture for holding a specimen, and a light



source for illuminating the specimen, the light source being located inside the clamping aperture in the specimen carrier.

4,511,225

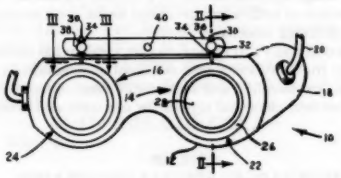
VARIABLE NEUTRAL DENSITY LASER GOGGLES

Herbert G. Lipson, 68 Aldrich Rd., Wakefield, Mass. 01880

Filed Dec. 23, 1982, Ser. No. 452,600

Int. Cl.³ G02C *7/12*

U.S. Cl. 351—49 **2 Claims**



1. Variable density laser goggles comprising:

a frame made of laser opaque material having a left and a right eye opening therein, said frame preventing laser radiation from entering into a user's eyes except through eye openings;

means for holding said frame to the user's head;

a plurality of variable density filter units removably secured to said frame in said eye openings, each of said filter units having a housing with means for removable attachment to said frame, means for removable attachment to another of said filter units, and for removable attachment to a laser filter for invisible radiation, said filter units having a three element polarizer mounted in said housing, and means for varying the absorbance of said polarizer, said three element polarizer providing an extended rotation adjustment range such that a user is able to precisely select a given absorbance without excessive attempts;

means for coupling said filter units in each of said eye openings wherein the amount of absorbance in each eye opening is substantially equal; and

means for filtering out invisible laser radiation removably attached to said filter units.

4,511,226

AVIATOR EYEGLASSES

Walter Freeman, 2501 Liberty St., Allentown, Pa. 18104

Filed Apr. 1, 1983, Ser. No. 483,944

Int. Cl.³ G02C *7/08*

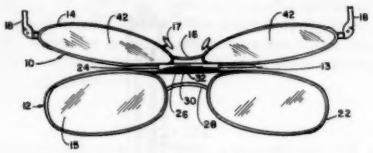
U.S. Cl. 351—57 **3 Claims**

1. In a pair of conventional wire-framed eyeglasses including two lenses, each lens circumferentially surrounded and retained by a wire frame, two movable nose pads attached to the inner edges of the lenses on their respective wire frames, two

wire temple pieces movably attached to and extending one each from the outer edges of each lens on respective wire frame, a wire bridge joining said lenses at the inner edges of their respective wire frames, and a resilient, double bar wire extending from the upper inside of one lens to the upper inside of the other lens, the improvement comprising:

(a) an auxiliary set of eyeglasses, each lens framed circumferentially with wire, said auxiliary eyeglasses also including a bridge and a resilient double bar wire;

(b) a wire crossbar attached at its ends, one each to said wire frame of said auxiliary eyeglasses proximate the frame's center top;



(c) a generally cylindrical sleeve circumscribing said auxiliary eyeglasses' wire crossbar, said sleeve sized to allow rotation of said crossbar inside said sleeve, said sleeve attached on each end to said wire lens frame of said conventional eyeglasses so that said sleeve joins said auxiliary lenses to said conventional eyeglasses; and,

(d) a detent on said sleeve at said sleeve's proximate center whereby when said auxiliary eyeglasses are rotated upward away from said conventional wire-framed eyeglasses, said detent catches said resilient double bar wire of said auxiliary eyeglasses and retains said auxiliary eyeglasses in a predetermined position.

4,511,227

OPHTHALMIC APPARATUS HAVING MEANS FOR AUTOMATIC DETECTION OF APPROPRIATE POSITION OF EYE TO BE EXAMINED

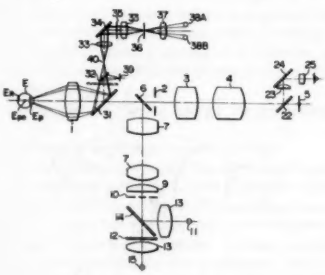
Kazuo Nunokawa, and Masayuki Masuyama, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1981, Ser. No. 304,575

Claims priority, application Japan, Sep. 24, 1980, 55-132662

Int. Cl.³ A61B *3/14, 3/10*; G03B *29/00*

U.S. Cl. 351—208 **3 Claims**



1. An opthalmoscopic apparatus comprising objective lens means having an optical axis and adapted to be positioned opposite to a patient's eye with a working distance, said patient's eye having a cornea with a center of curvature, means for detecting that the eye is properly positioned with respect to the objective lens means, said detecting means including a single target, a target image projection system adapted to project said target image by way of at least two light beams crossing each other on the optical axis of the objective lens means so that a target image is formed by each of the beams at the center of curvature of the cornea of the eye when the eye is properly positioned with respect to the objective lens means, a target image plane for forming target images, by mirror reflection at the cornea, of the light beams projected through the target projection system, whereby the spacing of the target images is changed in response to a change in the working distance and the target images are formed at the same position with the eye at the proper working distance.

4,511,228

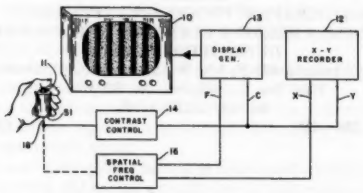
MEASUREMENT OF VISUAL CONTRAST SENSITIVITY

Henning E. von Gierke, Yellow Springs, and Adolf R. Marko, Fairborn, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 29, 1982, Ser. No. 403,247

Int. Cl.³ A61B *3/02*

U.S. Cl. 351—243 **17 Claims**



1. Visual examination apparatus for measuring visual contrast sensitivity of a subject using a display unit and recording means, the display unit having means to display on a screen a pattern comprising a sequence of light and dark areas at a selected spatial frequency with contrast which varies in accordance with the value of an analog characteristic of a first signal at a first input, said apparatus comprising:

contrast control circuit means having an output coupled to said first input for supplying said first signal, with means for varying said characteristic so that the contrast of said pattern may be automatically varied in an increasing or decreasing direction;

subject response means for developing a response signal having one or the other of two discrete signal states, the state being changeable under control of the subject in attempting to keep the contrast at a threshold level, the subject response means being coupled to the contrast control circuit means so that the direction of change of said characteristic is increasing for one state of said response signal and is decreasing for the other state and the contrast increases or decreases in accordance with the subject's response;

the output of the contrast control circuit means being also coupled to the recording means to record contrast values corresponding to the values of said characteristic at which the response signal changes condition.

4,511,229

METHOD AND APPARATUS FOR EVALUATION OF COLOR INFORMATION IN PHOTOGRAPHIC PROCESSES

Jack Schwartz, and Tai T. Wu, both of 147 Ridge St., Arlington, Mass. 02174

Filed Jun. 9, 1983, Ser. No. 502,561

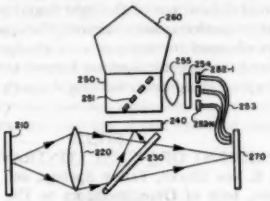
Int. Cl.³ G03B *41/00*

U.S. Cl. 354—20 **16 Claims**

1. A method of compensating for color variations in the light source illuminating a scene to be photographed, said method comprising

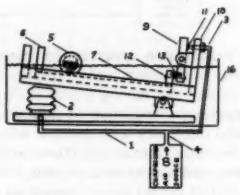
A. collecting a sample of light from said illuminating source;

B. coupling said sample to a plurality of test filters of preselected colors;
C. recording a color sample from each said test filter;
D. comparing each said recorded color sample against a corresponding plurality of color reference standards; and



E. calculating from said comparison the color compensation required to correct for said color variations in said light source.

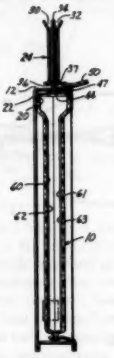
4,511,230
PHOTOGRAPHIC PROCESSING APPARATUS INCLUDING A ROCKING PLATFORM AND A ROLLING DEVELOPING TANK
Neil B. Cartwright, 693 E. 16th St., Idaho Falls, Id. 83401
Filed Sep. 9, 1983, Ser. No. 530,603
Int. Cl.³ G03D *3/04*
U.S. Cl. 354—299 **1 Claim**



1. Apparatus for uniformly processing photographic roll film, or photographic sheet material, said apparatus comprising: a base for supporting a rocking platform attached to said base, a sliding tray that slides back and forth on said rocking platform, said tray supporting a rolling developing tank, means for raising and lowering said rocking platform at one end by use of an air bellows, causing said tank to roll back and forth, means for supplying compressed air to said bellows, means for alternately introducing and exhausting air from said bellows by use of a mechanical air valve, said valve activated by action of said sliding tray alternately jarring and pulling an air valve paddle that opens and shuts said air valve, means for regulating the rate of rolling of said developing tank by adjusting the air supply pressure, means for operating the apparatus in a constant temperature water bath.

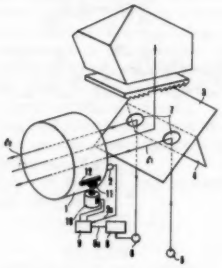
4,511,231
PROCESSING TANK FOR MAKING PHOTOGRAPHIC CONTACT PRINTS
Benjamin F. Ashby, 23942 Paseo del Campo, Laguna Niguel, Calif. 92677
Filed Jan. 10, 1984, Ser. No. 569,663
Int. Cl.³ G03D *9/00, 13/04*
U.S. Cl. 354—301 **15 Claims**

1. A processor for use in contact print processing of sheets of the diffusion transfer type, comprising:
a vertically oriented tank adapted to hold a developing solution, and including a pair of parallel tank walls spaced apart from one another, said tank having an upper aperture;
sheet guide means disposable adjacent to said aperture, said guide means comprising a separator disposed between a pair of parallel slots, which includes a pair of diverging guide members, one adjacent to each said slot, to deflect a respective one of said sheets from the respective slot toward a respective tank wall; and
compression means removably disposable adjacent to said aperture, said compression means including a straight-edged resilient member adapted to exert a compressive wiping force on said sheets when they are pulled past said resilient member;



whereby with solution in said tank, said sheets may be shoved through said slots and deflected toward respective tank walls by said guide means, and slide along said walls, after which said sheet guide means is removed and said compression means is disposed as aforesaid, and the upper ends of said sheets are pulled upwardly to draw the sheets past said compression means to press them together and remove the solution.

4,511,232
AUTO-FOCUS CAMERA
Yasuyuki Yamada, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 17, 1983, Ser. No. 495,426
Claims priority, application Japan, May 28, 1982, 57-90770; May 12, 1983, 58-81698
Int. Cl.³ G03B *13/22*
U.S. Cl. 354—403 **1 Claim**



1. An automatic focus camera comprising:
A. detecting means for receiving light passing through an interchangeable lens and and for detecting an in-focus position of the lens,
said light for detection of the in-focus position being in a different wavelength region from an image forming light

focused on a light-sensitive material through the objective lens;

B. signal receiving means for receiving a signal from an interchangeable lens,

said signal receiving means for producing chromatic aberration correction information as an electric signal representing a wavelength region of the interchangeable lens;

C. in-focus signal generating means for producing an in-focus signal on the basis of a signal from said light-receiving means; and

D. drive signal generating means responsive to the in-focus signal and the chromatic aberration correction information, for producing a signal to move said objective lens to the in-focus position that has been corrected for deviation based on the difference between the aberrations of the in-focus detecting light and the image forming light;

E. drive means for driving the objective lens to the in-focus position on the basis of the output signal of the drive signal generating means.

4,511,233

CHARGE CONTROL DEVICE IN A FLASH DEVICE FOR A CAMERA

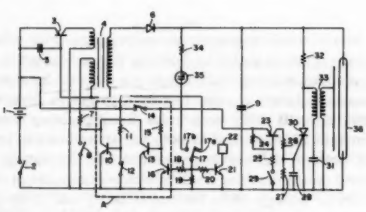
Kazuyuki Kazami, Tokyo, and Yoshiaki Ohtsubo, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Division of Ser. No. 257,356, Apr. 24, 1981, Pat. No. 4,441,774. This application Sep. 16, 1983, Ser. No. 532,951

Claims priority, application Japan, May 14, 1980, 55-62737; May 15, 1980, 55-65580[U]; May 15, 1980, 55-65581[U]; May 16, 1980, 55-66202[U]

Int. Cl.³ G03B 7/16

U.S. Cl. 354—418 **3 Claims**



1. A flash device adapted to be operatively associated with a camera which automatically carries out a sequence of operations including initiation of photography causing depression of a shutter button and opening of a shutter, and a finishing operation of the photography causing closing of the shutter, returning of the shutter button and take-up of one frame of film, the flash device comprising:

(a) a main capacitor for storing energy for generating flash light;

(b) means for supplying direct current voltage;

(c) a voltage convertor connected to said voltage supplying means and applying a boosted voltage of said direct current voltage to said main capacitor, the voltage convertor including a booster transformer and an oscillation circuit for applying an alternating current voltage to a primary winding of the transformer, the oscillation circuit being energized until said main capacitor is sufficiently charged;

(d) actuating switch means for triggering said oscillation circuit to intitiate oscillation thereof, the switch means being previously operated prior to said sequence in the camera; and

(e) re-actuating circuit means for triggering said oscillation circuit to initiate oscillation thereof, the reactuating circuit means being operatively associated with said finishing operation of said sequence.

4,511,234

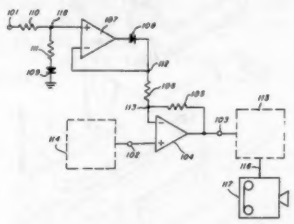
GAIN SWITCHING AMPLIFIER

Bernhard H. Andresen, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 307,720, Oct. 2, 1981, abandoned. This application Feb. 23, 1984, Ser. No. 582,133

Int. Cl.³ G03B 7/083

U.S. Cl. 354—428 **4 Claims**



2. A camera having a shutter for controlling the time light from an image to be recorded impinges a light sensitive recording material comprising:

(a) means for translating at least a portion the light from the image into an electronic signal;

(b) a logarithmic compression amplifier for amplifying said electronic signal as a logarithmic function of the magnitude of said signal;

(c) a second amplifier having an input to which said signal is applied, and having a predetermined gain within a predetermined range of said signal to produce an amplified signal;

(d) a circuit for compensating for reciprocity failure of the recording material, including means responsive to the magnitude of said signal for controlling the gain of said second amplifier outside said predetermined range;

(e) means to which said amplified signal is applied for logarithmically decompressing said amplified signal to produce a decompresses signal; and

(f) means for controlling the timing of said shutter in accordance with said decompressed signal.

4,511,235

SIMPLIFIED PAPER LOADING MECHANISM

Thomas J. Koller, West Linn, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 6, 1982, Ser. No. 446,883

Int. Cl.³ G03B 27/00; G03G 15/00

U.S. Cl. 355—1 **11 Claims**

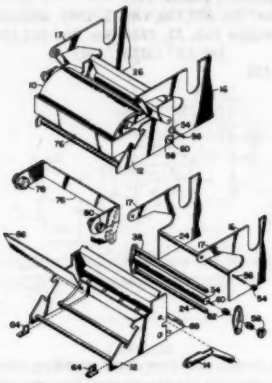
1. A paper loading mechanism for a copier for loading a continuous web of paper from a paper canister through a predetermined path, comprising:

cassette holder means for holding said paper canister in a predetermined position;

roller means including at least a paper drive roller means for feeding the paper into said copier and a foam roller means for pressing the paper against an image forming means of said copier, said drive roller means and said foam roller means being mechanically coupled together; and

paper guide means positioned intermediate said cassette holder means and said drive roller means for properly

guiding the paper from said cassette holder means to said drive roller means, one part of said paper guide means



being in contact with said foam roller means for feeding the paper to said drive roller means.

4,511,236

ELECTROPHOTOGRAPHIC PROCESS

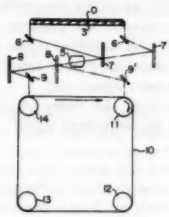
Takashi Yano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 27, 1982, Ser. No. 452,899

Claims priority, application Japan, Dec. 24, 1981, 56-210312

Int. Cl.³ G03B *27/34, 27/40, 27/70, 15/04*

U.S. Cl. 355—3 BE **12 Claims**



1. An electrophotographic process, comprising the step of:

moving a photosensitive member in the form of a belt and having a number of image forming regions, N_S, on a peripheral surface thereof, where N_S is equal to or greater than one, along an arcuate path so that the peripheral surface undergoes a cyclic movement in a given direction and such that said photosensitive member presents a planar configuration in the area where it is subject to exposure;

using a means for defining a slitwise exposure position, slitwise exposing the photosensitive member to a light image of an original during the movement of said photosensitive member thereby to define an electrostatic latent image which corresponds to the original, comprising,

moving, simultaneous to moving of said photosensitive member, the location of said slitwise exposure position at a uniform rate in the direction of movement of the peripheral surface of said photosensitive member and selecting the number of times, N_T, the same latent image is used in subsequent developing processing to be equal to or greater than two;

developing each said same latent image into a resulting visual image;

transferring each said resulting visual image from said photosensitive member to another media.

4,511,237

ELECTROPHOTOGRAPHIC REPRODUCING MACHINE

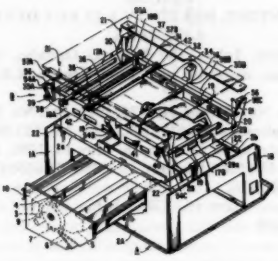
Shun Kawata, Tokyo; Isao Nosaka, Hachioji, and Hiroshi Katakura, Fuchu, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,820

Claims priority, application Japan, Apr. 8, 1982, 57-58523; Apr. 8, 1982, 57-58524; Apr. 8, 1982, 57-58525; Apr. 8, 1982, 57-58526; Apr. 8, 1982, 57-58527; Apr. 8, 1982, 57-58528; Apr. 8, 1982, 57-58529; Apr. 8, 1982, 57-58530; Apr. 8, 1982, 57-58531; Apr. 8, 1982, 57-58532

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **16 Claims**



1. An electrophotographic reproducing machine wherein an integrally formed dish-like housing for an exposure optical system which accommodates therein a slit plate for scanning of an exposure lamp, a projection lens, which is formed in its peripheral walls with vent holes for promoting ventilation within said machine and which has at its bottom portion a shield bottom wall serving as also a heat insulating plate is mounted onto a machine frame which accommodates therein a plurality of process units for reproducing and is opened upward, and a document glass plate is mounted at the top portion of said housing for the exposure optical system through glass mounting plates.

4,511,238

TRAVERSING, INTERMITTENTLY CONTACTING SHEET PICKOFF FOR ELECTROPHOTOGRAPHIC COPIER

Tatsu Hori, Los Altos, Calif., assignor to Savin Corporation, Stamford, Conn.

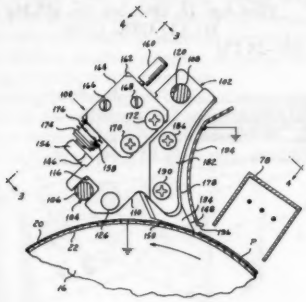
Filed Jul. 13, 1983, Ser. No. 513,359

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 SH **8 Claims**

1. In an electrophotographic copier having a photoconductor, means including a movable scanning element for forming a latent electrostatic image of a document on said photoconductor, means for developing said latent image to form a developed image, means for supplying a carrier sheet to said photoconductor, and means for moving said photoconductor past said image-forming means, said developing means and said sheet-supplying means, apparatus for separating said carrier sheet from said photoconductor including in combination a pickoff element, means for positioning said pickoff element in

engagement with said photoconductor, and means responsive to said scanning element for shifting said pickoff element transversely of said photoconductor with reference to the direction of movement thereof.



4,511,239

DEVELOPING DEVICE

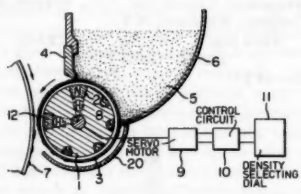
Junichiro Kanbe, Tokyo, and Nagao Hosono, Chofu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 594,961, Apr. 2, 1984, abandoned, which is a continuation of Ser. No. 452,289, Dec. 22, 1982, abandoned, which is a continuation of Ser. No. 114,216, Jan. 22, 1980, abandoned. This application Aug. 29, 1984, Ser. No. 645,530

Claims priority, application Japan, Feb. 2, 1979, 54-11662; Feb. 2, 1979, 54-11663; Feb. 2, 1979, 54-11664

Int. Cl.[3] **G03G** *15/09*

U.S. Cl. 355—3 DD **10 Claims**



1. A developing device comprising a movable non-magnetic developer-supporting means having a surface in facing relation to a fixed magnet, means for supplying magnetic developer, a magnetic member positioned at a principal pole of said magnet and in spaced relation to an opposite surface of said developer-supporting means for defining by magnetic force the application of said magnetic developer onto said opposite surface of said developer-supporting means, and means for regulating the relative position of said magnetic member with respect to said principal pole within the range of the magnetic field of said magnet to thereby adjust the development density.

4,511,240

ELECTROSTATIC RECORDING APPARATUS

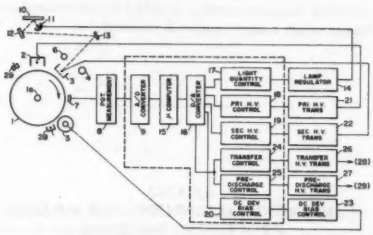
Koji Suzuki, Yokohama; Kouki Kuroda, and Jyoji Nagahira, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1982, Ser. No. 338,045

Claims priority, application Japan, Jan. 13, 1981, 56-2637; Jan. 13, 1981, 56-2638; Jan. 13, 1981, 56-2639; Jan. 13, 1981, 56-2640; Jan. 13, 1981, 56-2641; Jan. 13, 1981, 56-2643; Jan. 14, 1981, 56-3253; Jan. 14, 1981, 56-3254; Jan. 14, 1981, 56-3255; Jan. 14, 1981, 56-3256; Jan. 14, 1981, 56-3257; Jan. 14, 1981, 56-3258; Jan. 14, 1981, 56-3259

Int. Cl.[3] **G03G** *15/00*

U.S. Cl. 355—14 R **11 Claims**



1. An image forming apparatus comprising:

exposure means for exposing an image onto a recording medium;

image forming means utilizing said exposed image for forming an image on said recording medium; and

control means for detecting an image forming condition corresponsing to reflected light from a sample member and for controlling an operation condition of said exposure means based on the detected condition, wherein said control means further controls an operation condition of said image forming means in accordance with magnification of the image formation.

4,511,241

COPYING APPARATUS

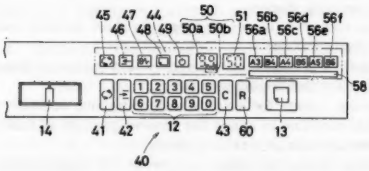
Hideaki Tsudaka; Takaji Washio; Nobuhiko Kozuka; Masahide Iseki; Toshio Watanabe; Masami Kai; Toshio Yoshiyama, and Hiromi Sakata, all of Osaka, Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Jul. 21, 1982, Ser. No. 400,284

Claims priority, application Japan, Jul. 21, 1981, 56-114941; Jul. 21, 1981, 56-114942; Nov. 27, 1981, 56-191275

Int. Cl.[3] **G03G** *15/00*

U.S. Cl. 355—14 CU **16 Claims**



1. In a copying apparatus for performing a successive copying operation mode wherein a first preset number of copying operations corresponding to a first original document is performed successively according to a preset operation, and for performing an operation wherein after a second preset number of copying operations corresponding to a second original document is intruded to be copied on the way of the successive

copying operation mode, the remaining number of copying operations of the first preset number corresponding to the first original document is performed, the improvement comprising;

a preset number display element for displaying the first and the second preset number of copying operations,

a first counting means for counting copying operations at each time when a single of copying operation is performed,

a copy number display element for indicating a number counted by the first counting means,

a second counting means for counting a copy paper discharged after completion of copying operation,

a detecting means for dectecting an occurrence of copy paper jamming, and

a control means for revising the value counted by the first counting means to a value counted by the second counting means when a copy paper is jammed.

4,511,242

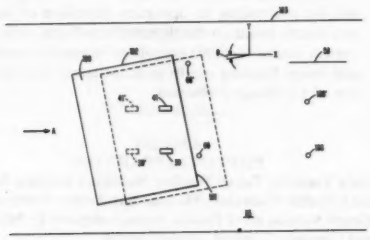
ELECTRONIC ALIGNMENT FOR A PAPER PROCESSING MACHINE

William H. Ashbee; Donovan M. Janssen, both of Boulder; Ronald J. Martin, Loveland, and William S. Seaward, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1982, Ser. No. 452,233

Int. Cl.³ B65H *9/20, 9/00;* G03B *27/00;* G03G *15/00*

U.S. Cl. 355—14 C **41 Claims**



1. An image producing machine including means for electronically aligning components of said machine for producing a nominally correct position at which image receiving sheets serially fed through said machine are properly aligned with images serially produced by said machine, comprising:

a processing station;

drive means for moving a receiving sheet through said processing station;

means for producing an image on said receiving sheet;

means for developing said image;

aligning means for electronically aligning components of said machine to adjust the relative position of said image and said image receiving sheet;

control means including programmable logic means connected to said aligning means to cause said aligning means to set up said machine to define a nominally correct position whereat images and image receiving sheets are properly aligned one with the other for subsequent production, said set up in accordance with a measure of alignment of the position of said image on said receiving sheet; and

entering means for introducing said measure of alignment into said control means.

4,511,243

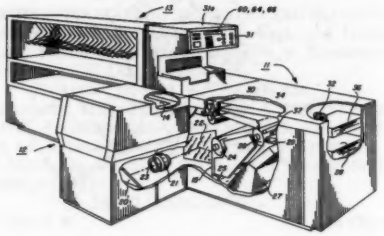
TIME TO COMPLETION INTERACTION FOR A COPIER

Craig A. Smith, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 15, 1983, Ser. No. 485,352

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 CU **4 Claims**



1. The method of providing a continuous ongoing time to or of completion indication in regard to a programmed reproduction run in an electrostatographic printing system having a copy sheet processor including a machine clock system adapted to provide a signal indicative of the constant time to produce a single copy during the run and the copy sheets exiting the processor, comprising the steps of:

generating a signal indicative of the total number of copies to be produced during the run from the number of originals supplied by an operator and the number of copies programmed for the run,

generating a signal indicative of the total time required to produce the programmed run from the application of the signal indicating the constant time to produce a single copy to said signal indicating the total number of copies to be produced,

continuously modifying said total time signal as copies are being produced by a signal from a real time device thereby providing a continuous ongoing time to completion of the reproduction run, and

displaying said continuously modified signal in a display device as a countdown time to or of completion for the programmed run.

4,511,244

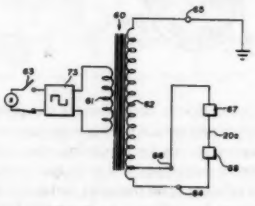
CORONA GENERATING APPARATUS AND METHOD

Hans P. Baumeister, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 6, 1983, Ser. No. 529,444

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 FU **8 Claims**



1. In an apparatus for generating a corona discharge current, the apparatus including:

an electrode having first and second terminals for producing a corona discharge current when connected to a source of

electrical potential that is sufficiently high to cause said electrode to generate a corona discharge current;

a transformer having a pair of output terminals between which a high EMF is generated, means coupling one terminal of the electrode to one of the terminals of the transformer to establish an electrical potential that is sufficiently high to produce a corona discharge current; and the improvement which comprises:

means tapping an intermediate output of the transformer and coupled to the other terminal of the electrode for establishing a relatively small EMF between the ends of the electrode for generating a current through said electrode.

4,511,245

MULTIFUNCTION REPROGRAPHIC APPARATUS

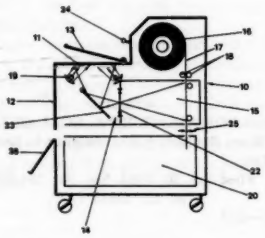
Fred Luscher, 22, Quai du Cheval-Blanc, 1227 Geneva, Switzerland

Filed Mar. 27, 1979, Ser. No. 24,439

Claims priority, application Switzerland, Mar. 30, 1978, 3380/78

Int. Cl.³ G03B *27/52, 27/70*

U.S. Cl. 355—43 **6 Claims**



1. Multifunction reprographic apparatus for alternatively making a photocopy of a two-dimensional original or a photograph of a three-dimensional subject, said apparatus comprising a housing having front, top and rear walls, a first window in said front wall of the housing, a second window in the top wall of the housing, means positioning photosensitive paper vertically in said housing in front of said rear wall, an optical system comprising an objective lens for focusing an image on said photosensitive paper and a mirror movable between a first position in which an image of a 3-dimensional subject positioned in front of and spaced from said first window is directed by said objective lens onto said photosensitive paper and a second position in which an image of a 2-dimensional original placed on said second window is directed by said mirror and said objective lens onto said photosensitive paper, means in said housing for illuminating an original placed on said second window, and change-over means for moving said mirror between said first and second positions and for moving said objective lens along its optical axis toward said photosensitive paper to change the size of the image and depth of field of said optical system when said mirror is moved from said second position to said first position.

4,511,246

SIZE DETECTING DEVICE OF A COPY DOCUMENT SUITABLE FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

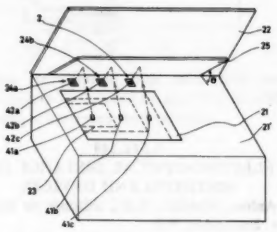
Haruo Nishiyama, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 29, 1984, Ser. No. 594,729

Claims priority, application Japan, Apr. 20, 1983, 58-60019[U]

Int. Cl.³ G03B *27/62;* **G03G** *15/00*

U.S. Cl. 355—75 **10 Claims**



1. A detecting device for detecting the size of a copy document for an electrophotographic copying machine comprising:

document table means on which the copy document is placed;

document cover means pivotally provided on the document tables means to cover the copy document;

sensor means for sensing the size of the copy document on the document table means, the copy document being subjected to optical scanning; said sensor means comprising a light receiving element for receiving light and a light emitting element for emitting light;

light reflecting means pivotably disposed between the document table means and the document cover means, whereby the angle of disposition of the light reflecting means can be varied independent of the document cover means,;

said light emitting element of the sensor means emitting light toward the reflecting means and said light receiving element of the sensor means receiving light reflected by the reflecting means; and

detection means responsive to the output of the light receiving element of the sensor means for detecting the size of the copy document.

4,511,247

SURVEYING TECHNIQUE WITH CORRECTION OF OPTICAL ERRORS CAUSED BY ATMOSPHERIC TURBULENCE

Paul A. McGovern, 440 Second St., Dunellen, N.J. 08812, and Mauro Zambuto, 445 W. 23 St., New York, N.Y. 10011

Filed Aug. 31, 1982, Ser. No. 413,478

Int. Cl.³ G01C *5/04*

U.S. Cl. 356—3 **11 Claims**

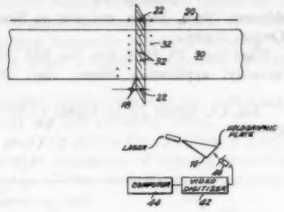
1. A method of surveying a structure of large dimension in which optical errors caused by environmental turbulence are statistically corrected comprising:

placing visible grid markers at predetermined locations on said structure;

reconstructing a holographic reference grid and superimposing the reconstructed reference grid on selected ones of said grid markers;

recording the locations of images of said selected grid markers and of the reconstructed grid a plurality of times; and

determining statistical means of the locations of the images of each said selected grid marker relative to the reconstructed grid from said plurality of said recordings thereof.

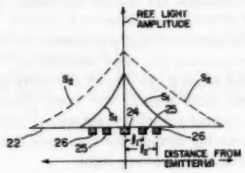


4,511,248

ACTIVE ELECTRO-OPTICAL DISTANCE DETECTION METHODS AND DEVICES

Daniel C. Abbas, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 30, 1982, Ser. No. 394,002
Int. Cl.³ G01C *3/08, 3/10*
U.S. Cl. 356—4 **6 Claims**



1. A device for determining the distance to a light reflective object, said device comprising:

(a) lens means having an optical axis and a focal plane;

(b) emitter means for directing light through said lens means to such object from an emitter zone at or proximate said focal plane;

(c) detector means for producing signals indicative of the amplitude of light, within the blur circle formed by the light reflected from said object back through said lens means, at two detection zones respectively located at different distances from said emitter zone, said detection zones being coplanar with said emitter zone in a plane substantially normal to the optical axis of said lens means; and

(d) signal processing means responsive to the detector means signals to produce an output signal indicative of the difference in amplitudes of such detector means signals, such that said output signal is substantially proportional to the slope of the distance-from-emitter zone versus light-amplitude curve of object reflected light, such slope varying predictably with object distance; whereby said output signal is indicative of an object's distance from the device.

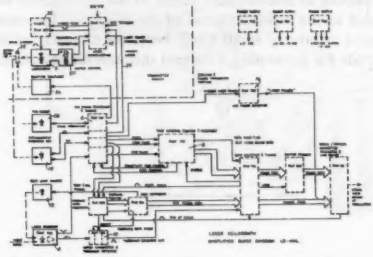
4,511,249

MICROPROCESSOR-DRIVEN LASER CEILOMETERS

Frank Frungel, Herwigredder 105a, 2000 Hamburg 56, DE, and Jürgen Rohr, Barmbeker Str. 163, 2000 Hamburg 60, DE, both of Fed. Rep. of Germany

Continuation of Ser. No. 225,968, Jan. 14, 1981, abandoned. This application Oct. 20, 1983, Ser. No. 543,782
Int. Cl.³ G01C *3/08;* **H01J** *40/14;* **H01L** *9/00*
U.S. Cl. 356—5 **7 Claims**

1. An automated self-checking long lived laser ceilometer including a transmitter and a receiver, said transmitter comprising a laser diode array consisting of a plurality of laser diodes; an electronic pulse generator having an input and an output and being set for driving respective laser diodes of said array at less than the normal maximum pulse peak power and/or repetition rate; an auxiliary photosensitive feed-back control member receiving at said transmitter a part of the laser light emitted by said transmitter for feed-back controlling the input of said pulse generator, the feed-back control being dimensioned in such a way that dropping of the emitted laser power due to aging or a failure of a laser diode is continuously compensated by higher input of said pulse generator; and an analogue or digital power indicator coupled to the output of said pulse generator to show the measure of fading of said laser diode array, thereby enabling the user for provide a timely replacement of said laser diode array.

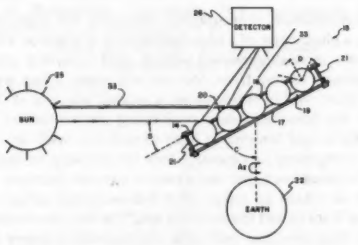


4,511,250

APPARATUS FOR MEASURING SCALAR IRRADIANCE

Arthur A. Olsen, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Jul. 20, 1981, Ser. No. 284,424
Int. Cl.³ G01J *1/42*
U.S. Cl. 356—225 **2 Claims**



1. An apparatus for measuring the scalar irradiance of a given vicinity produced by all sources over a given angular range, comprising:

a planar array of convex spherical surfaces;

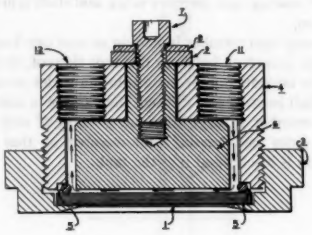
a detector oriented toward said array;

shielding between said convex spherical surfaces to limit the portion of each sphere which is within the view of said detector wherein said shielding is a plate having holes which abut and secure said convex spherical surfaces.

4,511,251
APPARATUS AND PROCESS FOR MEASURING THE COLOR OF PAINTS

Allan F. Falcoff, Lake Orion; Eric Mikkelsen, Pontiac, and Allan B. J. Rodrigues, Bloomfield Hills, all of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 10, 1982, Ser. No. 440,572
Int. Cl.³ G01N *21/05*
U.S. Cl. 356—246 **2 Claims**



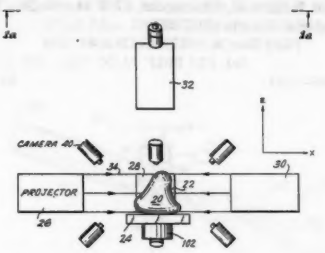
1. An apparatus for inspection of a fluid comprising:
a cylindrical housing having a cylindrical cavity therein,
a light transmitting window enclosing one end of the cavity,
a cylindrical insert member positioned in said cavity having a flat horizontal surface area and being in a closely spaced relationship with the window providing a fluid chamber where fluid flows between said window and the flat surface area of said insert member at a uniform velocity across the window and said cylindrical insert member having a vertical flat surface on opposite sides of the insert member which in combination with the housing forms an inlet channel to the fluid chamber and an outlet channel from the fluid chamber,
a fluid inlet connected to the inlet channel and a fluid outlet connected to the outlet channel in communication with said fluid chamber, wherein fluid flows through the inlet and through the inlet channel into the fluid chamber and out of the chamber through the outlet channel and the outlet, the flow of fluid through the chamber being an undirectional laminar flow and having a Reynold's Number of 50–200.

4,511,252
ARRANGEMENT FOR SENSING THE GEOMETRIC CHARACTERISTICS OF AN OBJECT

Paul L. Di Matteo, Huntington; Joseph A. Ross, Fort Salonga, and Howard K. Stern, Greenlawn, all of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Continuation of Ser. No. 608,265, Aug. 27, 1975, Pat. No. 4,175,862. This application Jun. 1, 1979, Ser. No. 44,644
The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.
Int. Cl.³ G01B *11/00*; G01C *11/04*
U.S. Cl. 356—375 **4 Claims**

1. A method for sensing and locating points on a surface comprising the steps of: generating a projection field directed onto a surface; subdividing said projection field into a number of sections; irradiating said surface with different variations of said subdivided projection field so that each section is illuminated at least once; recording within a field of view images of said surface as irradiated by the subdivided projection field; recording a calibrated reference surface and reading said recorded images in relation to said reference surface to define the

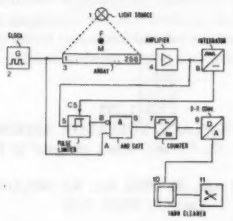


location of a predetermined point on said first-mentioned surface and appearing within said field of view.

4,511,253
DEVICE FOR MEASURING THE TRANSVERSE DIMENSION OF A THREAD

Rolf Glöckner, Egg, and Hansruedi Stutz, Dietlikon, both of Switzerland, assignors to Gebrüder Loepfe AG, Wetzikon, Switzerland

Filed Sep. 10, 1982, Ser. No. 417,190
Claims priority, application Switzerland, Sep. 30, 1981, 6290/81
Int. Cl.³ G01B *11/10, 11/02*
U.S. Cl. 356—385 **6 Claims**



1. A device for measuring the transverse dimension of a thread by means of optoelectronical thread scanning means and thereto connected signal evaluation circuitry:
(A) the optoelectronical thread scanning means comprising:
(i) a light source for illuminating the thread;
(ii) an array of optoelectronical sensors receiving light emanating from the light source and modulated by the thread;
(iii) clock means producing, in successive scanning cycles, pulse series for scanning the array of optoelectrical sensors; and
(B) the signal evaluation circuitry comprising:
(i) amplifying means operatively connected to the array of optoelectrical sensors;
(ii) signal limiting means having a signal input connected to the amplifying means, and a control terminal;
(iii) signal integrating means connected between the amplifying means and said control terminal; and
(iv) logic means having a first input connected to the clock means and a second input connected to the signal limiting means.

4,511,254

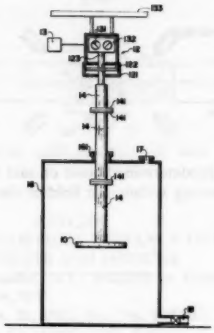
CAVITATORS

Henry North, R.R. #16, Thunder Bay, Ontario, Canada (P7B 6B3), and William R. Fauconnier, 1759 Meryle St., Thunder Bay, Ontario, Canada (P0T 2Z0)

Filed Dec. 6, 1982, Ser. No. 447,009

Int. Cl.³ B01F *11/00*

U.S. Cl. 366—118 **22 Claims**



1. A cavitator comprising a chamber, means for admitting and removing fluid material from the chamber, a cavitator plate having opposed cavitator surfaces, means mounting the cavitator plate within the chamber so as to expose both said surfaces to fluid material in said chamber, (for oscillatory movement therein,) high power sonic frequency oscillation means including an eccentric member and means for rotating the member about an axis to produce oscillatory movements and mechanical interconnection means for communicating the oscillatory movement to the cavitator plate (.) whereby said plate causes cavitation of said fluid material, said communicating means having a natural frequency of vibration dependent upon its mechanical construction, the frequency of the oscillatory movement and the natural frequency being arranged such that one is substantially a whole number multiple of the other.

4,511,255

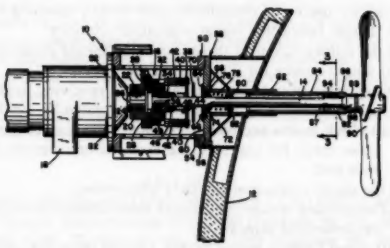
CLEAN-IN-PLACE AGITATOR ASSEMBLY

David O. Saucier, St. Cloud, Minn., assignor to DCI, Inc., St. Cloud, Minn.

Filed Apr. 30, 1984, Ser. No. 605,216

Int. Cl.³ B01F *7/02*

U.S. Cl. 366—138 **7 Claims**



1. In an agitator assembly of the type including a motor connected to the outer end of a drive shaft extending through a tubular housing with an impeller secured to the inner end of the shaft, the improvement which comprises:

means defining a slide coupling interconnecting said motor and shaft for driving rotation and for limited axial movement of said shaft between inner and outer positions;

means for normally biasing said drive shaft toward the outer position;

seal means disposed between said drive shaft and the outer end of said shaft housing;

a bearing/seal member disposed between said shaft and the inner end of said shaft housing;

said impeller including a base portion adapted for rotary sealing engagement with a seat formed in an adjoining end of said bearing/seal member when said shaft is in the outer position;

said bearing/seal member including at least one longitudinal passage extending between the ends thereof; and

means for introducing cleaning solution under pressure into said shaft housing and through the passage in said bearing-/seal member to urge the base portion of said impeller away from said bearing/seal member so that cleaning solution is discharged into the tank.

4,511,256

APPARATUS FOR THE CONTINUOUS MIXING OF PULVERULENT SUBSTANCES WITH LIQUIDS

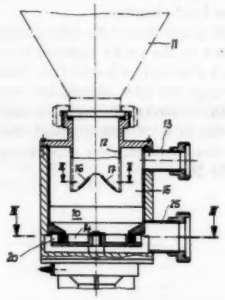
Roland Karg, Montana, and Helmut Sattelmaier, Affalterbach, both of Fed. Rep. of Germany, assignors to Ytron Dr. Karg GmbH, Affalterbach, Fed. Rep. of Germany

Filed Sep. 2, 1983, Ser. No. 528,720

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243671

Int. Cl.³ B01F *7/26, 15/02*

U.S. Cl. 366—165 **16 Claims**

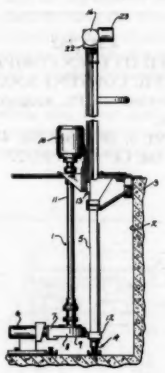


1. An apparatus for the continuous mixing of pulverulent substances and liquids, said apparatus comprising: feed means for feeding pulverulent substances, a mixing chamber arranged below the feed means and into which said feed means extends, liquid suction tube means extending tangentially of and opening into an upper area of the mixing chamber, a pump impeller positioned within said mixing chamber and below said liquid suction tube means, said impeller providing a radially outwardly directed conveying action to material within said mixing chamber, screen means surrounding the pump impeller along an outer circumferential surface thereof, outlet means positioned in the mixing chamber adjacent said impeller, and flow deflectors positioned in an annular space between the feed means and an inner wall of the mixing chamber in such a way that a flow deflection is brought about in the tangentially entering liquid to form a dense mist of liquid droplets that move violently and irregularly to contact and wet the pulverulent substance and form a colloid.

4,511,257
PUMP POSITION RETAINER APPARATUS

James R. Roberts, Grayslake, Ill., assignor to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Jul. 1, 1983, Ser. No. 510,214
Int. Cl.³ B01F 5/12
U.S. Cl. 366—262 11 Claims

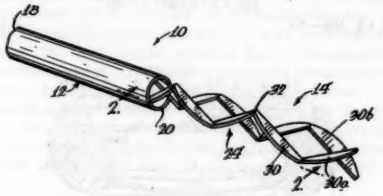


11. An apparatus for retaining the vertical position of an object comprising an object having considerable mass, a fixed supporting structure, means for mounting the object for vertical movement relative to said structure, drive means for raising and lowering the object and including a flexible member interconnected between the object and the supporting structure, the weight of the object applying substantial tension to said flexible member during normal operation of said drive means, descent arresting means operably connected to said object and responsive to slackening of said flexible member for arresting free descent of said object, said descent arresting means comprising a second flexible member having one end connected to said object and being movable in a path of travel in accordance with movement of said first flexible member, said descent arresting means also including locking means mounted for movement between a locking position wherein said locking means engages said second flexible member to prevent movement of said second flexible member and thereby prevent movement of said first flexible member and a release position, slackening of said first flexible member acting to move said locking means from the release to the locking position, said second flexible member comprising a chain having one end connected to said object and the opposite end connected to a weight and a sprocket mounted on the supporting structure to support said cable in travel, said locking means comprising a first locking element secured to the sprocket and a second locking element engageable with said first locking element when said locking means is in the locked position, and a link pivotally connected to the supporting structure, biasing means operably connected to one end of the link to urge the link in one direction, said first flexible member being connected to the opposite end of said link and arranged so that the weight of said object exerts a force on said link opposed to the force exerted by said biasing means and greater than the force of said biasing means, said second locking element being connected to said link, slackening of said first flexible member removing the force exerted by said object on said link and enabling said biasing means to pivot said link and thereby move said second locking element into engagement with said first locking element.

4,511,258
STATIC MATERIAL MIXING APPARATUS

James L. Federighi, and Frank F. Federighi, both of Palatine, Ill., assignors to Koflo Corporation, Arlington Heights, Ill.

Filed Mar. 25, 1983, Ser. No. 478,865
Int. Cl.³ B01F 5/00, 15/02
U.S. Cl. 366—337 10 Claims



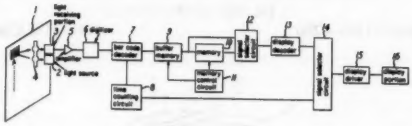
1. A static material-mixing apparatus comprising a conduit having an axis and defining a chamber extending longitudinally therethrough opening on first and second ends of said conduit, a mixing element including two substantially identical continuous segments in said chamber between said first and second ends and each having a sinuous cross-section between said first and second ends, said segments being axially staggered and in engagement with each other generally along said axis with connection means between points of engagement so that said segments substantially close said chamber when viewed from one end thereof.

4,511,259
BAR CODE INPUT ELECTRONIC TIMEPIECE

Teruo Horiuchi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed May 27, 1983, Ser. No. 498,695
Claims priority, application Japan, May 28, 1982, 57-91043
Int. Cl.³ G04B 47/00
U.S. Cl. 368—10 12 Claims

A

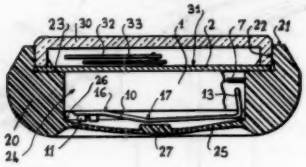


1. In an electronic timepiece of the type having timekeeping means for keeping time and display means for visually displaying time information: read-in means for reading in bar code data representative of selected information in bar-coded form and producing corresponding coded data signals; decoding means for decoding the coded data signals and producing corresponding decoded data signals representative of the selected information in bar-decoded form; memory means for storing the decoded data signals; and read-out means for reading out the decoded data signals from the memory means and producing corresponding display drive signals and applying the display drive signals to the display means for visually displaying the selected information.

4,511,260
IMPROVED QUARTZ WATCH HAVING A SEMI-RIGID WATCH CASE BOTTOM AND A TIME SETTING SYSTEM USING AN ELECTRICAL CONTACT

René Pasquier, 18 Bis, rue Burgat-Charvillon, 74000 Annecy, France

Filed Jul. 5, 1983, Ser. No. 510,769
Claims priority, application France, Jul. 6, 1982, 82 12048
Int. Cl.³ G04C 17/00
U.S. Cl. 368—69 3 Claims

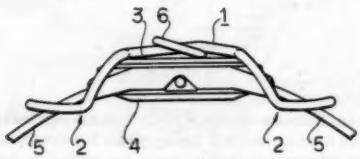


1. A watch of the type comprising:
a plastic semi-rigid movable case covered by a protective transparent face,
hands,
an electronic mechanism with quartz resonator located inside the case, and in which said mechanism does not rest on the bottom of the case which is a semi-rigid material capable of being elastically deformed under force, and recovering its initial position, the said mechanism comprising time-setting means by electrical contact between the positive pole of a battery and the negative pole of an electronic module containing a time-setting program, the rear face of the mechanism comprising means facing the bottom of the watch case for making an electrical contact between the two said poles, so that in response to a force exerted on the bottom of the casing, the means designed to make a contact between said two poles is activated, for setting the mechanism to a desired time and wherein;
the thickness of the bottom of the case decreases progressively for its entire length from the case periphery towards its center, but increases close to said center to form a projection for resting on said contact means.

4,511,261
WRISTWATCH PROTECTOR

Mitsutaka Mishima, No. 30, 2-chome, Ohashi, Miyazaki-shim, Miyazaki-ken, Japan (880)

Continuation of Ser. No. 455,942, Dec. 15, 1982, abandoned.
This application Sep. 5, 1984, Ser. No. 648,331
Int. Cl.³ G04B 37/00
U.S. Cl. 368—286 5 Claims

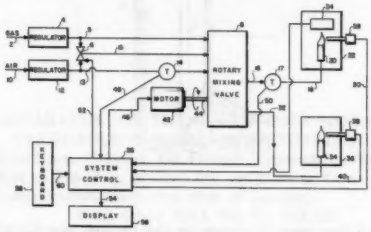


1. A non-metallic protector for a wristwatch comprising:
first and second means for attachment to a wristband, each having an outer ring portion with a bar extending across the center thereof such that the wristwatch band may be extended through and held by said means;
a buffer bar connecting said first and second attachment means such that when said first attachment means holds said band on one side of a wristwatch and said second attachment means holds said band on the other side of said wristwatch, said buffer bar extends across the face of said wristwatch without significantly obscuring said face;
ring means encircling but not fixedly attached to said buffer bar such that a portion of said interlocking ring means lifts at least a portion of said buffer bar away from said wristwatch face so as to form a margin of space between said face and said buffer, and such that said ring means itself protects a substantial portion of said face without significantly obscuring said face.

4,511,262
FUEL ENTRAINED OXYGEN COMPENSATION FOR CALORIFIC CONTENT ANALYZER

Samuel A. Arcara, Doylestown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 6, 1982, Ser. No. 433,181
Int. Cl.³ G01N 25/22
U.S. Cl. 374—37 13 Claims



1. A gas analyzing apparatus comprising first connection means for a source of a fuel gas, second connection means for a source of combustion air,
ratio control means for producing a mixture of fuel gas and air in a selectively variable ratio, said ratio control means having a first inlet, a second inlet, a third inlet and an outlet arranged to receive a flow mixture obtained from said first, second and third inlets,
means connecting said first connection means for a fuel gas source to said first inlet of said ratio control means,
means connecting said second connection means for a source of air to said second inlet of said ratio control means,
selectively controlled valve means for providing a connection between said third inlet and said first connection means for a source of fuel gas in a first mode of operation and between said third inlet and said connection means for a source of air in a second mode of operation,
combustion means connected to said outlet from said ratio control means for producing a combustion of said mixture of fuel gas and air,
sensor means for sensing combustion products from said combustion means to produce an output signal representative of the combustion state of said combustion means and
controller means arranged to respond to an output from said sensor means for controlling said ratio control means and for switching said valve means between said first and second modes of operation to produce substantially stoichiometric combustion of said mixture of fuel gas and air in said first and second modes of operation.

4,511,263
BOMB-TYPE CONDUCTION CALORIMETER

Edward J. Prosen, 621 Warfield Dr., Rockville, Md. 20850

Filed Jul. 12, 1983, Ser. No. 513,074
Int. Cl.³ G01N 25/22
U.S. Cl. 374—38 10 Claims

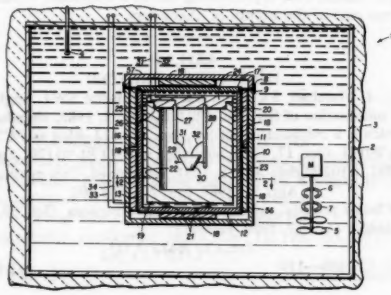
1. A conduction-type macrocalorimeter for measuring heat energy emitted by a test substance comprising:

a sensor box having an inner compartment, an outer compartment, and heat flow detecting means within a gap defined by said inner and outer compartments;

said inner compartment being of high thermal conductivity and diffusivity, and having interior and exterior surfaces, said interior surface completely containerizing said test substance;

said outer compartment being of high thermal conductivity and diffusivity, and having interior and exterior surfaces, said exterior surface defining the outermost extent of said sensor box, said interior surface of said outer compartment closely conforming to said exterior surface of said inner compartment and completely containerizing said inner compartment;

said gap surrounding said inner compartment and being defined by said exterior surface of said inner compartment and said interior surface of said outer compartment, such



that spacing between said gap defining surfaces remains substantially uniform;

heat flow detecting means for sensing heat flow from said test substance and generating a signal proportional to said heat flow, said heat flow detecting means being in intimate contact with said gap defining surfaces and substantially filling said gap to thereby minimize dead space within said gap;

a substantially infinite heat sink in intimate contact with said exterior surface of said outer compartment;

interpreting means for receiving said signal from said heat flow detecting means and generating an output related to said heat energy emitted from said test substance;

whereby substantially all said energy emitted by said test substance is transferred by conduction from said inner compartment to said outer compartment through said heat flow detecting means and dissipated to said substantially infinite heat sink.

4,511,264

GAS TEMPERATURE MONITORING DEVICE

Robert M. Bucha, Glenshaw; Albert J. Dzermejko, Jeanette, and James G. Stuart, Pittsburgh, all of Pa., assignors to Raymond Kaiser Engineers Inc., Oakland, Calif.

Filed Apr. 11, 1983, Ser. No. 483,552

Int. Cl.³ G01K *1/16*

U.S. Cl. 374—135 **2 Claims**

1. A gas temperature monitoring device for monitoring hot gases in a furnace, comprising:

a tubular protective member adapted to extend into a hot gaseous medium of a furnace, the member having a closure at its one forward end within the furnace, and having its other end exterior of the furnace;

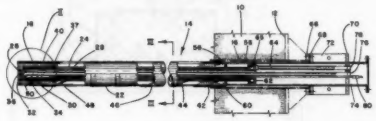
a first tubular member disposed axially within the protective member having its forward end spaced from the forward end of the protective member and having closure means at its forward end;

refractory material disposed in the space between the protective member and the first tubular member;

a second tubular member disposed within and axially aligned with the first tubular member and dimensioned to provide a liquid flow passage between the first and second members;

a third tubular member extending through the second member for introducing a liquid coolant into the exterior end of the second tubular member and for conducting the coolant through the second member to the forward end of the same, the third tubular member being dimensioned to provide a space between the second and third members;

annular closure means secured to the forward ends of the second and third members and spaced from the closure at the forward end of the first tubular member, whereby liquid coolant introduced into the third tubular member flows through the same to the space between the end



closure of the first tubular member and from thence through the space between the first and second tubular members;

temperature sensing means comprising a thermal couple and leads connected to the same;

means forming a passage extending through one side of the protective member and also through the refractory material and into the space between the first and second members and through the space between the second and third tubular members to the exterior end of the protecting member; and

said heat sensitive thermal couple and leads connected to the same extending within said passage to the exterior end of the protective member with the thermal couple located adjacent said one side of the protective member and in contact with the surrounding gas;

liquid coolant introduced into the third tubular member.

4,511,265

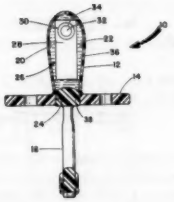
TEMPERATURE-RESPONSIVE PACIFIER ASSEMBLY

Dieter R. Berndt, Neptune, N.J., assignor to TRP Energy Sensors, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 351,107, Feb. 22, 1982, Pat. No. 4,447,164. This application Feb. 28, 1983, Ser. No. 470,463

Int. Cl.³ G01K *1/08, 11/12*

U.S. Cl. 374—151 **13 Claims**



1. An improved heat-responsive pacifier assembly, which comprises of:

a pacifier body including a nipple portion defining an interior chamber sealable by plug means; and

a temperature responsive element and a liquid sealingly positioned in said interior chamber of said nipple portion of said pacifier body, said temperature responsive element

comprised of an elongated strip element having thereon a disposed temperature display means including a liquid crystal composition displaying a color change visually through said pacifier body at a temperature above about 98.6° F.

4,511,266

ARRANGEMENT FOR MOUNTING A BEARING RING ON A ROTARY CYLINDER

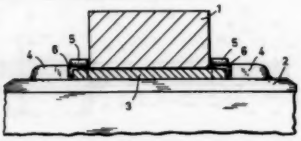
Fred Klotmann, Cologne, and Ralf Filges, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed May 26, 1983, Ser. No. 498,585

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1982, 3223773

Int. Cl.³ F16C *13/00*; F26B *11/04*; F27B *7/22*

U.S. Cl. 384—441 **4 Claims**



1. A rotary kiln construction comprising in combination:
a rotary kiln cylinder having a cylindrical outer surface;
an annular bearing ring for supporting the kiln in rotation and having an inner circumference larger than the outer circumference of the cylinder;
a plurality of spacing plates located between the ring and cylinder and circumferentially spaced from each other;
and supporting assemblies at each axial side of the bearing ring including a support element welded to the outer surface of the cylinder, abutment strips mounted thereon axially engaging the sides of the bearing ring preventing axial displacement thereof, and
angle lugs mounted on the ends of the abutment strips and having a portion axially engaging said spacing plates preventing axial displacement thereof.

4,511,267

METHOD FOR CHANGING THE SUPPLY OF CHARACTERS IN AN IDEOGRAPHIC TYPEWRITER BY COMBINING AND STORING INDIVIDUAL CHARACTERS

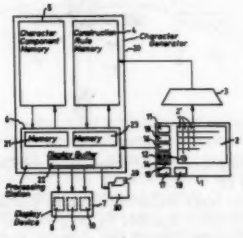
Cornel Pokorny, Accum, and Horst Brendes, Schortens, both of Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Nov. 17, 1982, Ser. No. 442,606

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148685

Int. Cl.³ B41J *3/02*

U.S. Cl. 400—110 **15 Claims**



1. Method for operating an ideographic typewriter having input means, a character generator having memory means containing memory locations which can be addressed via the input means, and a display device, the display device having at least one standard character area for the display of ideographic characters, and the memory means of the character generator storing data representing a supply of characters which can each be displayed in the standard character area, said method being carried out for altering the supply of characters represented by the data stored in the character generator, and comprising: displaying, in the standard character area, a first character for which data is already stored in the character generator; reducing the size of the first character displayed in the standard character area with respect to at least one dimension of the character if required; displaying, in the standard character area, at least one further character for which data is already stored in the character generator, to create a new character constituted by the first and further characters as thus displayed; and storing in a location of the memory means of the character generator, which location can be addressed via the input means, data representing the new character which then forms part of the supply of characters.

4,511,268

HIGH SPEED PRINTER

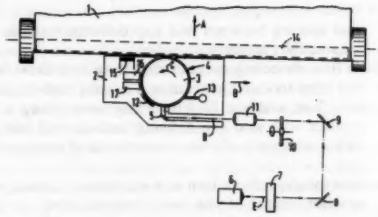
Eric J. Marshall, 5 Carlton Gardens, London SW1, England

Continuation of Ser. No. 499,025, Jun. 2, 1983, abandoned, which is a continuation of Ser. No. 270,513, filed as PCT GB 80/00171, Oct. 17, 1980, published as WO 81/01120, Apr. 30, 1981, § 102(e) date Jun. 5, 1981, abandoned. This application Apr. 11, 1984, Ser. No. 598,405

Claims priority, application United Kingdom, Oct. 19, 1979, 7936450; Oct. 17, 1980, 8000171

Int. Cl.³ B41J *3/00*

U.S. Cl. 400—119 **2 Claims**



1. An apparatus, for printing entire characters serially onto a receiver along a printer line, comprising:
a rotatable carrier having a photoconductive circular periphery;
means for providing an electrostatic charge on said periphery;
optical means for directing a plurality of images of entire characters serially onto said charged periphery acquiring a series of uncharged areas each corresponding to a respective one of said characters;
means for applying a heat-fixable toner material having an electrostatic charge serially to each uncharged area of said periphery as said carrier rotates whereby said toner material becomes electrostatically adherent to said uncharged areas;
a stationary receiver structure;
a carriage means translatable parallel to said printing line for interconnecting said carrier and said receiver structure for continuously translating said carrier at constant speed simultaneously with said carrier rotation in a straight line in a plane normal to said carrier axis of rotation along and in contact with said receiver such that adherent material of each area is brought serially into a position contacting said receiver with the direction and rate of rotation of said carrier with respect to the direction and rate of translation of said carrier relative to said receiver being such that, in the position of said contact, there is not relative motion

along the line between the adherent material and said receiver wherein said carriage has located thereon said rotatable carrier, said charging means, said toner applying means, means for removing toner material, and means for discharging the periphery of said carrier;

means for applying an electrostatic field to cause transfer of said adherent material from said carrier to said receiver at said position of contact;

heating means for fixing transferred material on said receiver; and

means connecting said heating means to said carrier for movement of said heating means simultaneously with said carrier along said line in a position trailing said carrier.

4,511,269

CANCEL TYPE PRINTING HEAD

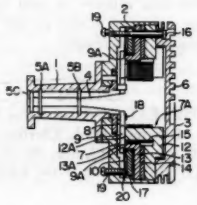
Kazue Takahashi; Kenzi Okuna; Isao Nakajima, all of Ibaraki; Mineo Harada, Owariasahi, and Yutaka Kako, Kasugai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 31, 1983, Ser. No. 480,788

Claims priority, application Japan, Apr. 12, 1982, 57-59519

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **7 Claims**



1. A printing head comprising lever components each having printing wires and driving mechanisms for said lever components,

each of said lever components driven by said driving mechanisms including a lever body connected to the associated printing wire,

an attraction member provided at one end of said lever body and adapted to be attractively moved by a magnetic attraction of a permanent magnet interposed between yokes constituting said driving mechanisms,

a spring member coupled to said attraction member and having a free end portion adapted to be biased to create a resilient force therein for displacing the associated printing wire,

means for adjusting a resilient force of said spring member, said means including an insert member which engages said free end portion of said spring member while being received in an opening of said free portion for displacing the free end portion of the spring member toward the yokes, and

wherein a fulcrum of rotation for said lever component is formed between said attraction member and a magnetic polar face of a yoke confronted with said attraction member.

4,511,270

APPARATUS FOR LIFTING PRINT AND CORRECTION RIBBONS IN TYPEWRITERS OR LIKE MACHINES

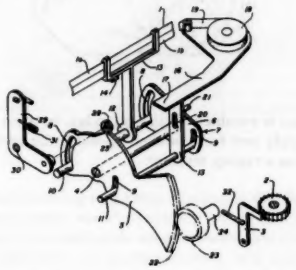
Christian Bohmer, Nuremberg, Fed. Rep. of Germany, assignor to Triumph-Adler A.G. fur Buro- und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 509,336

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1982, 3227714

Int. Cl.³ B41J *35/23, 29/36*

U.S. Cl. 400—214 **2 Claims**



1. Apparatus for independently lifting print and correction ribbons from a rest position to a print line comprising

means including a first liftable shaft carrying a print ribbon for movement to said print line,

means including a second liftable shaft carrying a correction ribbon for movement to said print line,

lift lever means,

means supporting said lift lever means for oscillation about a fixed axis,

said lift lever means having arcuate slots located on either side of said fixed axis for supporting said first and second shafts in a home position, and for lifting one or the other of said first and second shafts according to the direction of movement of said lift lever means from said home position,

said lift lever means including gear means,

a motor driven shaft rotatable from a home position in forward and return direction about said home position and a reverse and return direction about said home position according to a print or a correction ribbon lift sequence, and

a pinion connected to said motor shaft and engaged with said gear means for driving said lift lever means.

4,511,271

TYPING RIBBON CARTRIDGE WITH BLOCKING ELEMENT

Giacomo Oberto, Pavone, Italy, assignor to Olivetti Accessori, S.p.A., Ivrea, Italy

Filed Jun. 7, 1983, Ser. No. 501,819

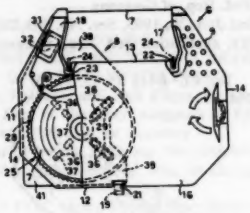
Claims priority, application Italy, Jun. 7, 1982, 67728 A/82

Int. Cl.³ B41J *35/28*

U.S. Cl. 400—208 **7 Claims**

1. A removable cartridge for a typing ribbon with a blocking element comprising a container having a bottom and a cover, wherein the bottom comprises a sleeve and a series of slots and the cover comprises four ribs which project inwardly of the container and are disposed at 90° relative to each other; and a ribbon supply reel, on which the typing ribbon is wound, comprising a hub which is rotatable about the sleeve and a flange which is fixed to the lower end of the hub; and wherein the blocking element comprises a substantially flat plate of limited thickness having a series of dished portions which project from the plane of the plate and which are snapped into

the series of slots for engaging the lower surface of the flange and raising the ribbon supply reel until the upper edge of the typing ribbon is arrested against the four ribs, when the block-



ing element is mounted on the cartridge, so as to prevent the ribbon supply reel from unwinding when the cartridge is not mounted on a typing machine.

4,511,272

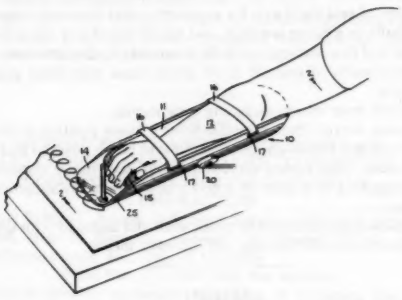
WRITING PROSTHESIS

Jason W. Brown, 63 Park Ave., Bronxville, N.Y. 10708, and Mitchell N. Ackerman, Providence, R.I., assignors to Jason W. Brown, Bronxville, N.Y.

Filed May 16, 1983, Ser. No. 495,086

Int. Cl.³ B43K *29/00*

U.S. Cl. 401—6 **14 Claims**



1. A writing prosthesis comprising:

a base adapted to engage and to support the entire forearm and the elbow of a user and having a forward portion extending beyond the distal ends of the fingers of the user;

means for securing said base to the forearm;

a handrest mounted on said base and contoured to engage the palm and fingers;

mounting means for removably securing a writing implement to said forward portion of said base for writing contact with an adjacent writing surface to be inscribed upon; and

rotatable support means connected to the base for supporting the writing instrument and the forearm for universal movement relative to said surface;

whereby, the prosthesis and the forearm may be controlled solely by the shoulder muscles of the user to cause the writing implement to inscribe intelligent indicia on said surface.

4,511,273

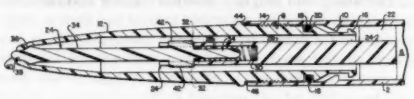
CORRECTION FLUID DISPENSER HAVING A RETRACTABLE AND LOCKABLE SEALING TIP

Robert A. Trotta, Pembroke, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 425,199, Sep. 28, 1982, abandoned, which is a continuation-in-part of Ser. No. 319,245, Nov. 9, 1981, abandoned. This application Dec. 13, 1983, Ser. No. 561,135

Int. Cl.³ B43K *8/00, 1/06*

U.S. Cl. 401—260 **7 Claims**



1. A correction fluid dispenser comprising a body member adapted to retain a correction fluid, a barrel member engaged with said body member, a core portion extending axially of said body member and said barrel member, a tip seal member telescopically engaged with said core portion, and a spring means disposed between said core portion and said tip seal member, said body member and said barrel member being relatively rotatable to a first position in which said tip seal member is spring biased toward an orifice in said barrel member to retractably block said orifice to prevent flow of said fluid therethrough unless the spring bias is overcome and a second position in which said core portion is moved axially to its telescopic limit to force said tip seal member against said orifice to prevent retraction of said tip seal member, said core portion and said tip seal member being adapted to rotate with said body member and relative to said barrel member and orifice to provide a wiping action to aid in the removal of particulate material or fluid residue.

4,511,274

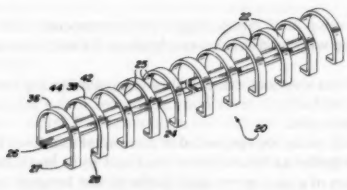
LOOSELEAF BINDER ASSEMBLY

Ted Chen, 11060 - F Artesia Blvd., Cerritos, Calif. 90701

Filed Jul. 14, 1983, Ser. No. 513,639

Int. Cl.³ B42F *13/06, 3/04;* B41L *3/06*

U.S. Cl. 402—21 **7 Claims**



1. A loose leaf binder assembly for holding a plurality of sheets comprising:

a backbone member having two grooved slots, each groove slot being located on each side of said backbone member;

a second member whose length is sustantially equal to said backbone member with a plurality of rounded resilient fingers with one end of said rounded resilient fingers rigidly attached to a portion of said second member, said portion also having a continuous flange substantially perpendicular to said one end of fingers and facing the unattached end of said rounded resilient fingers,

an inwardly facing tang on said unattached end of said rounded resilient fingers, said flange and said tangs cooperatively engaging and sliding into said grooves on each side of said backbone member, such that said backbone

member and said second member are in substantial alignment when fully engaged; and

means for locking said second member to said backbone member when said second member and said backbone member are in substantial alignment with each other.

4,511,275

CLAMPING MECHANISM

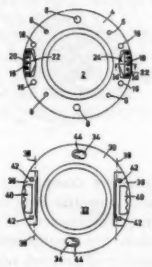
Francis J. Span; Aloysius T. M. Boland, and Albertus J. A. J. van Laarhoven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 20, 1982, Ser. No. 380,167

Claims priority, application Netherlands, May 21, 1981, 8102498

Int. Cl.³ F16C *11/00*; F16D *1/12, 3/00*

U.S. Cl. 403—33 **5 Claims**



1. A clamping mechanism for exchangeably coupling two elements together in a preselected angular orientation, said clamping mechanism comprising:

a first coupling plate attached to one element;

a second coupling plate attached to the other element;

means for loosely coupling the first and second coupling plates to each other, said loose coupling means forming a tight coupling when the coupling plates are pressed away from each other; and

means for pressing the coupling plates away from each other, said pressing means being operable only when the coupling plates are positioned at the preselected angular orientation;

wherein the pressing means comprises:

a spring attached to the first coupling plate, said spring being biased to oppose any force compressing the spring toward the first coupling plate; and

a folding hand grip attached to the second coupling plate, said hand grip being pivotable through a plane of the second coupling plate;

wherein, when the coupling plates are loosely coupled in their preselected angular orientation and the hand grip is pivoted into the plane of the second coupling plate, the hand grip bears on the spring and compresses it toward the first coupling plate.

4,511,276

CYLINDER PISTON ROD COUPLER

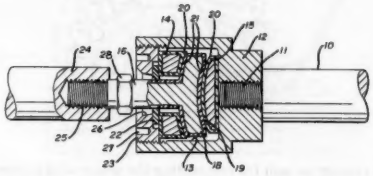
Kingsley A. Doutt, P.O. Box 888, Alpena, Mich. 49707

Filed May 4, 1983, Ser. No. 491,525

Int. Cl.³ F16C *11/06*

U.S. Cl. 403—77 **3 Claims**

1. An improvement in a coupling for misaligned shafts having a housing adapted to be attached to one of said shafts and a stud with an enlarged curved end portion attached to the other one of said shafts with the enlarged end portion of the stud movably caged in said housing between guide members therein by a retaining ring, the improvement comprising means for sealing said housing with respect to said other one of said shafts and secondary means forming slippery surfaces on said guide members and on said stud, said housing having a threaded socket in one side wall and an opening oppositely thereto, said guide members in said housing engaging the opposite sides of said enlarged curved end of said stud, said guide members having curved surfaces matching said opposite sides of said enlarged curved end of said stud, a retaining ring engaged in said opening in said housing, one side of said retaining ring having a first annular surface and a second annular surface spaced radially and sidewardly of said first annular



surface, said retaining ring being engaged in said opening with said second annular surface engaging one of said guide members so as to hold said guide members with said curved end of said stud between said guide members, said stud extending through said retaining ring, said means for sealing said housing comprising a resilient sealing gland on said stud spaced with respect to said enlarged curved end of said stud and movably engaged between said first annular surface of said retaining ring and one of said guide members so as to be movable transversely of said housing with said stud.

4,511,277

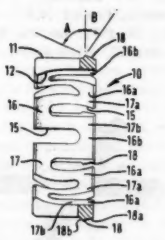
BALL JOINTS AND LINERS THEREFOR

Graham McCabe, Witham, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 14, 1981, Ser. No. 282,986

Int. Cl.³ F16C *11/06*

U.S. Cl. 403—140 **10 Claims**

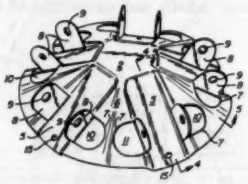


1. A liner for a ball joint comprising an annulus of resiliently deformable plastics material having an inner spherical bearing surface, at least one end portion of the annulus having a plurality of axially extending circumferentially spaced tongues which can be deflected radially to dilate the end of the annulus, characterised in that at least some of the tongues have inner surfaces which lie in the spherical bearing surface, and at least one other tongue which has a radially outwardly extending projection for retaining the liner in a bearing mounting and an inner surface which is spaced radially outwardly from the spherical bearing surface.

4,511,278
CONNECTOR UNIT FOR GEODESIC DOME FRAME STRUT

Richard T. Robinson, Riverside, Calif., assignor to Delta Engineering Co., Covelo, Calif.

Filed Mar. 2, 1983, Ser. No. 471,283
Int. Cl.³ E04B 1/32
U.S. Cl. 403—172 3 Claims

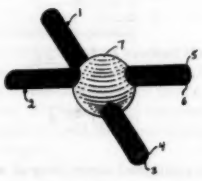


1. A connector unit for connecting the struts which form the framework of a geodesic dome comprising:
(a) a sheet metal member having the general shape of a frustum of a right circular cone,
(b) five equally spaced rectangular depressions in the outer surface of the frustum and extending between the bases of the frustum, the length sides of the rectangular depressions being parallel to the elements of the frustum,
(c) a triangular area lying between each adjacent pair of rectangular depressions,
(d) a flange extending outward from each side of each rectangular depression,
(e) the plane of each flange being perpendicular to the plane of the related rectangular depression and the flanges on opposite sides of each rectangular depression being in mirror image relation, each flange being formed by opening a portion of the triangular area adjacent the rectangular depression and bending it upward to perpendicular relationship with the plane of the rectangular depression, and
(f) an opening in the central area of each flange and the openings in the flanges extending outward from opposite sides of each rectangular depression being in register with each other.

4,511,279
CABLE TIE FOR AN AIR SUPPORTED STRUCTURE CABLE NET

Carmine Carpanzano, New Rochelle, N.Y., assignor to Air Structures International, Tappan, N.Y.

Filed Aug. 31, 1982, Ser. No. 413,266
Int. Cl.³ F16B 1/00
U.S. Cl. 403—266 8 Claims

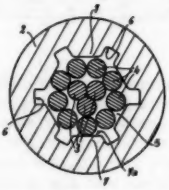


1. The combination comprising: a pair of crossing cable sections; and a permanent cable tie comprising a body of fused material having embedded therein said pair of crossing cable sections, said body of fused material surrounding the region of crossing of said cable sections and making tight contact with and adhering to said cable sections for preventing relative movement therebetween, said crossing cable sections are each comprised of a metallic core and an outer sheath of a fusible material surrounding said metallic core, and wherein the overlapping portions of the respective outer sheaths of said crossing cable sections are fused together.

4,511,280
ANCHORING OR CONNECTING SLEEVE FOR MULTISTRAND CABLE CONDUCTOR

Robert Saint-Prix, Saint-Etienne, and Henri Montmartin, Unieux, both of France, assignors to Societe Nouvelle des Etablissements Dervaux, Chambon Feugerolles, France

Filed Jul. 14, 1982, Ser. No. 398,239
Claims priority, application France, Jul. 15, 1981, 81 14115
Int. Cl.³ F16G 11/02
U.S. Cl. 403—274 8 Claims

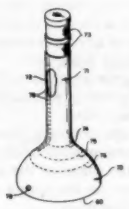


1. A cable-gripping sleeve comprising a tubular body of deformable material with a central bore of noncircular cross-section, said bore forming a multiplicity of generally flat cable-contacting faces separated by longitudinal zones of reduced wall thickness forming internal grooves substantially narrower than said faces facilitating an approach of said faces to one another upon an exertion of radial stresses serving to constrict said body around an engaged cable.

4,511,281
ROAD-SURFACE MOUNTABLE DELINEATOR SUPPORT MEMBER

Donald W. Schmanski, Carson City, Nev., assignor to Carsonite International Corporation, Carson City, Nev.

Filed Oct. 14, 1981, Ser. No. 311,350
Int. Cl.³ E01F 9/01
U.S. Cl. 404—10 3 Claims



1. A resilient, road-surface mountable delineator adapted for use with traffic moving at moderate speeds, said delineator being comprised of an integrally formed tube structure and support base;
said tube structure having a composition (represented by modulus of elasticity) and geometric configuration which develop greater stiffness in the tube structure as compared to stiffness in the support base to thereby create a preferential mode of collapse in response to a vehicle impact wherein the support base is adapted to collapse and dissipate impact energy by formation of wave-like contortions within support base wall structure in preference to total collapse of the tube structure, thereby avoiding deforma-

tion of the tube structure over an impacting surface such as a vehicle bumper;

said support base being sectionally comprised of integrally formed neck, shoulder and larger collapsible body sections, said neck and shoulder sections having a composition and geometric configuration which develops sufficient compressional stiffness based on elastic modulus in compression and compressional moment of inertia to maintain the attached delineator in operational orientation and to transfer most of said compression forces into the larger, collapsible body wall section; and

said neck and shoulder sections of the support base further comprising a solidified foam insert retained within the neck and shoulder sections.

4,511,282

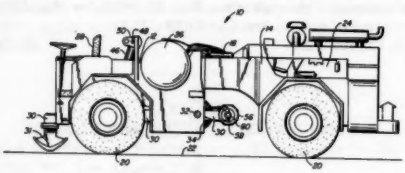
PAVEMENT PENETRATING TOOL

Raymond A. Gurries, Reno, Nev., assignor to Resonant Technology Company, Sparks, Nev.

Continuation-in-part of Ser. No. 329,149, Dec. 10, 1981, Pat. No. 4,402,629, which is a continuation-in-part of Ser. No. 157,138, Jun. 5, 1980, Pat. No. 4,340,255. This application May 9, 1983, Ser. No. 492,922

Int. Cl.³ E01C *23/12*

U.S. Cl. 404—90 **7 Claims**



1. In a pavement breaker including a mobile vehicle adapted to ride over the surface to be penetrated, a resonant beam having input and output antinodes at input and output ends respectively and at least one node between the ends of the beam at which the beam is mounted to the vehicle, and means for vibrating the resonant beam at at least near its resonant frequency, an improved tool depending from the output end of the beam comprising a flange with a striking surface extending in the operative direction of motion of the vehicle and having a shape which is curved so that the angle between the direction of motion of the striking surface at the point of contact with the surface to be penetrated and the tangent to the striking surface at the point of contact with the surface to be penetrated is constant throughout the stroke of the tool.

4,511,283

METHOD AND APPARATUS FOR SEALING OF PAVEMENT SEAMS

Henry H. Duval, 3944 Boca Bay Dr., Dallas, Tex. 75234; Donald Kennedy, 9741 E. Lake Highlands Dr., Dallas, Tex. 75218, and Milton J. Muesse, 13120 Mitchwin, Dallas, Tex. 75234

Filed Mar. 18, 1983, Ser. No. 476,461

Int. Cl.³ E01C *23/02*; B67B *7/24*

U.S. Cl. 404—107 **7 Claims**

1. A dispensing apparatus for filling the gap between pavement sections with a sealant composition comprising:

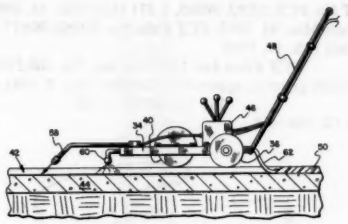
a wheeled support platform movable over said pavement sections;

a first container disposed on said wheeled support platform and containing a liquid sealant composition;

a second container disposed on said wheeled support platform and containing water;

a source of compressed air disposed on said wheeled support platform having a plurality of outputs, a first output of said plurality of outputs coupled to said first container and a second output coupled to said second container; and

an applicator adapted to move over said gap in said pavement sections, said applicator including a first applicator nozzle coupled to a source of compressed air and disposed so as to remove dust and loose debris from said gap, a



second applicator nozzle coupled to said second container and disposed so as to moisten said gap after said dust and loose debris have been removed and a third applicator nozzle coupled to said first container and disposed so as to fill said gap with said liquid sealant composition after said dust and loose debris have been removed and said gap has been moistened.

4,511,284

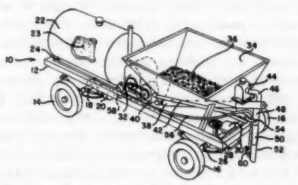
POTHOLE PATCHER

Carl L. Sterner, Rte. 4, Box 372, Bakersfield, Calif. 93309

Filed Aug. 10, 1983, Ser. No. 521,945

Int. Cl.³ E01C *19/10, 19/18*

U.S. Cl. 404—111 **7 Claims**



1. In a road repair truck of the type having a vehicle frame amounted on a pair of front wheels and a pair of rear wheels, an aggregate material hopper on said vehicle frame, a conveyor screw in the hopper bottom, means for driving said screw, a conveyor tube forming the bottom of said hopper and extending from the forward end of said hopper and within which said conveyor screw is disposed, and a vertically disposed discharge chute connected to the forward end of said conveyor tube and having a discharge outlet extending downwardly below the conveyor tube beyond the front end of said vehicle frame for dispensing aggregate material therefrom, said conveyor screw conveying aggregate material from said hopper to said discharge chute for deposit in a pothole to be repaired, means for applying asphalt coated aggregate to the road to be repaired comprising

a first air inlet formed on the discharge chute between the conveyor screw and the discharge outlet,

means for applying a flow of air to the air inlet so as to create a helical downward flow of aggregate material in the chute,

an asphalt outlet disposed at the discharge outlet, and

means for applying heated asphalt under pressure to the asphalt outlet,

said asphalt outlet being disposed with respect to the discharge chute outlet so that, upon the aggregate material

passing through the discharge outlet, asphalt from the asphalt outlet is sprayed thereon.

4,511,285

OIL-CLEARING ELEMENT HAVING TWO OR MORE MOVABLE FLOATING BODIES

Hans Eriksson, Nygatan 11, Kristinehamn, Sweden

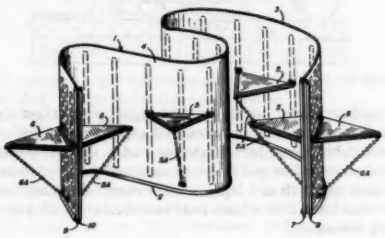
PCT No. PCT/SE82/00245, § 371 Date Mar. 31, 1983, § 102(e) Date Mar. 31, 1983, PCT Pub. No. WO83/00517, PCT Pub. Date Feb. 17, 1983

PCT Filed Jul. 15, 1982, Ser. No. 488,546

Claims priority, application Sweden, Aug. 7, 1981, 8104731

Int. Cl.³ E02B *15/04*

U.S. Cl. 405—66 **3 Claims**



1. Oil clearing apparatus for preventing the spread of oil in waterways, lakes, sea and the like, comprising a flexible rectangular wall element including opposed sides, spaced parallel longitudinal edges, and spaced ends, said rectangular wall element being provided with a number of floating bodies on both sides thereof along a line parallel to said longitudinal edges, said bodies being sheet-like and pivotable about said line whereby each sheet may selectively assume a substantially perpendicular position in relation to the wall element, the rectangular wall element being provided adjacent its ends with joinder means for enabling another such wall element to be joined onto each end, said joinder means, adjacent each wall element end, comprising a pair of extending flexible strips joined and hinged together and along said end, said strips providing a pair of elongate flexible free end edges extending along each end and in a direction normal to said longitudinal edges of the wall element, a rod element engaged with and extending along each of said free end edges, each rod element including end portions protruding beyond the longitudinal edges of the wall element, the pair of flexible strips on said wall element end extending outward of the wall element end and outward relative to each other whereby to selectively receive laterally therebetween the rod element of a further wall element with the corresponding end portions of the rod elements aligned for reception of a retaining ring element thereabout to thereby bunch the protruding end portions of the rod elements of two adjacent wall elements together and provide an elongate joining of the wall elements one to another.

4,511,286

FLEXIBLE BARRIERS

Nicholas P. Hardacre, Dibden Purlieu, England, assignor to Leigh Flexible Structure Ltd., Dorset, England

Filed Oct. 27, 1981, Ser. No. 315,550

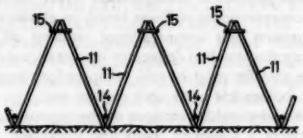
Claims priority, application United Kingdom, Oct. 27, 1980, 8034511

Int. Cl.³ E02B *7/02, 7/20;* E02D *5/00;* F16M *11/32*

U.S. Cl. 405—115 **17 Claims**

1. A barrier which may be extended in a spanning direction across a waterway transverse to the direction of gravity-directed waterflow, said barrier comprising:

support means and a flexible web supported thereby and which provides a barrier surface impeding the waterflow, the support means being situated behind the flexible web and including a plurality of support members presenting a common transverse support surface for said web, individual ones of said support members being tilted in alternating opposite directions within said common support surface and along the spanning direction of the barrier and each being connected with a respective similar support member disposed to mutually oppose further tilting movement within said common support surface.



4,511,287

SUBMERGED BUOYANT OFFSHORE DRILLING AND PRODUCTION TOWER

Edward E. Horton, Rancho Palos Verdes, Calif., assignor to Global Marine, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 146,362, May 2, 1980, abandoned. This application Dec. 30, 1981, Ser. No. 335,886

Int. Cl.³ E02B *17/00*

U.S. Cl. 405—204 **31 Claims**

1. Apparatus useful for defining at an offshore location in an ocean and the like in water of substantial depth a submerged installation providing a connection point for the drilling of a subsea hydrocarbons well by use of drilling equipment normally useful only in waters of substantially shallower depth, the finished installation comprising an elongate, slender, unguyed, positively buoyant erect tower structure extending from a lower end at the ocean floor to an upper end disposed at a selected depth below the water surface, the apparatus comprising

a. a tubular tower base section defining at a lower end thereof means adapted for connecting the section directly to the ocean floor and for holding the section from upward movement when subjected to substantial upwardly directed force, the base section having an upper end adapted to mate coaxially with and be secured to a lower end of one of a plurality of tubular tower central sections,

b. a tubular tower upper section having a lower end adapted to mate coaxially with and be secured to an upper end of a tubular tower central section and having an upper end defining at least one connection point for the drilling of a subsea hydrocarbons well, the connection point being

arranged for access thereto and for connection of selected equipment thereto from above,

c. a plurality of tubular tower central sections each adapted at upper and lower ends thereof to mate coaxially with and to be secured to the lower and upper ends of others of the central sections or the upper end of the base section or the lower end of the upper section, as appropriate, the central sections being sufficient in number and aggregate length that when the central sections are connected in series between the base and upper sections there results a tower structure having a length equal to the distance between the selected depth and the ocean floor at said offshore location,

d. buoyancy means within the upper section and at least some of the other tower sections operable for controlling the buoyancy of the corresponding tower section,

e. whereby, upon serial interconnection of all of the tower sections and connection of the lower section to the ocean floor, there results a submerged tower as aforesaid, and

f. at least one tubular drilling riser duct carried by the tower in a selected position relative to the tower and extending along the entire length of the tower, each duct being coupled to the tower at selected locations therealong to be secure from significant lateral movement relative to the tower, there being the same number of riser ducts as there are drilling connection points defined at the upper end of the tower upper section, the ducts being connected at their upper ends to the respective drilling connection points.

4,511,288

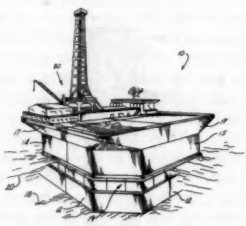
MODULAR ISLAND DRILLING SYSTEM

Sherman B. Wetmore, Westminster, Calif., assignor to Global Marine Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 325,778, Nov. 30, 1981, Pat. No. 4,422,803. This application Nov. 22, 1982, Ser. No. 443,529

Int. Cl.³ E02B *15/02*

U.S. Cl. 405—217 **77 Claims**



1. An arctic offshore structure of the gravity type movable buoyantly to and from a position over a site of use located on a sea floor under waters in a selected range of depths, the structure when installed at the site extending from a lower end substantially at the sea floor through and above the water surface to an upper operations end of the structure which is adapted to carry a selected operations facility, the structure through a portion thereof between (a) a first location adjacent its lower end and below the water surface and (b) a second location in the structure a substantial distance above the water surface having substantially vertical and substantially flat outer walls, the structure in said portion being comprised of at least one unitary base unit, each base unit being floatable, each base unit being reversibly ballastable adequately to impart to the structure sufficient negative buoyancy, in combination with the nature of the sea floor, to maintain a desired position at the site under environmental forces applied horizontally to the structure.

4,511,289

METHOD OF ROCK BOLTING AND ROCK BOLT

Lorne R. Herron, Beaconsfield, Canada, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Oct. 14, 1982, Ser. No. 434,177

Claims priority, application Sweden, Oct. 19, 1981, 8106165

Int. Cl.³ E21D *20/00*

U.S. Cl. 405—259 **10 Claims**

1. A method of rock bolting comprising:

inserting a rock bolt (**10**) in a borehole which rock bolt comprises a radially expansible tube (**11**) which, before being used, has a deep longitudinal depression (**12**) and is closed at its inner end (**14**);

then coupling the outer end (**13**) of the tube (**11**) to an external source of hydraulic high pressure fluid so that the tube (**11**) is plastically deformed to expand so as to cause permanent gripping action against the inner surface of the borehole, whereafter the tube (**11**) is relieved of pressure; and

before expanding of said tube (**11**) by said pressure fluid, mounting a radially expandable insert means (**20**) between the tube (**11**) and the borehole, said insert means (**20**) surrounding the tube so that said deep longitudinal depression (**12**) cannot be fully expanded in the borehole when the tube (**11**) is plastically deformed to radially expand upon application of said high pressure fluid, said insert means engaging both the tube and the inner surface of the borehole so as to be clamped therebetween.

4,511,290

SUPPORT FRAME FOR UNDERGROUND MINING OPERATIONS

Walter Lubojatzki, Recklinghausen, Fed. Rep. of Germany, assignor to Klöckner-Becorit GmbH, Castrop-Rauxel, Fed. Rep. of Germany

Filed May 12, 1982, Ser. No. 377,356

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118939

Int. Cl.³ E21D *15/44*

U.S. Cl. 405—292 **4 Claims**

1. A support frame for serving as a face support in mining operations comprising:

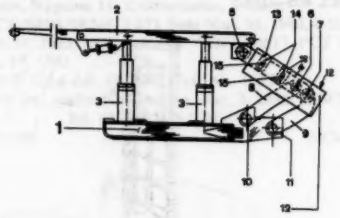
a floor of a seam support supportable on the floor of the seam;

a roof of the seam support for supporting the roof of the seam;

at least one hydraulic strut coupling said seam support floor and said seam support roof and serving to brace the same between the roof of the seam and the floor of the seam; and

at least one stabilization element and guide therefor pivota-

bly coupled and disposed between said seam support floor and said seam support roof pivotable in the longitudinal direction of the support frame to define a pivot plane, at least one of said stabilization element and said guide comprising a plurality of parallel, spaced-apart planar leaf springs, the planar surfaces of which are disposed parallel



to said pivot plane, which are resistant to bending in said pivot plane and resilient to compressive and torsion forces, said leaf springs having restoring forces great enough to return the roof of the seam support to its initial position upon release from the bracing between the roof of the seam and the floor of the seam.

4,511,291

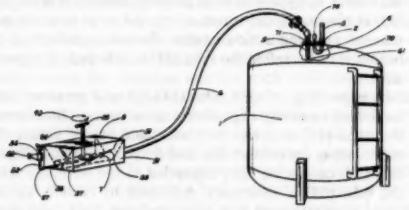
VACUUM MATERIAL CONVEYING APPARATUS

Norman C. Quates, Sr, P.O. Box 896, Harvey, La. 70059, and Norman C. Quates, Jr., 1716 Orchid, Harvey, La. 70058

Filed Jun. 3, 1982, Ser. No. 384,629

Int. Cl.³ B65G *53/14*

U.S. Cl. 406—128 **1 Claim**



1. An adaptor for conveying fluidizable material to a pressurizer tank provided with a removable lid which selectively at least partially seals said tank, said adaptor comprising:

an adaptor lid configured to replace said removable lid for selectively at least partially sealing said tank;

a venturi mounted on said adaptor lid and having first and second flared ends, the first end thereof being in fluid communicating relationship with the interior of said tank through a venturi opening in the adaptor lid, the second end of said venturi being in fluid communicating relationship with the atmosphere;

a generally U-shaped pipe having a first end and a second end, the first end thereof being disposed in the interior said tank adjacent the first end of said venturi for directing a stream of pressurized fluid thereinto, the second end of said U-shaped pipe being in fluid communicating relationship with a source of pressurized fluid through a pressure introduction aperture in the adaptor lid;

a delivery conduit having a first end in fluid communicating relationship with the interior of said tank through a delivery aperture in the adaptor lid, and a second end through which said materials are introduced, the first end of said conduit being provided with a projection for conveying the fluidized material to a distance into said tank beyond said venturi opening in the adaptor lid to prevent fluidized material from being introduced into said venturi;

an aperture through said delivery conduit adjacent its second end through which said fluidizable material enters said delivery conduit;

a pipe inserted into said delivery conduit for delivering a flow of pressurized fluid to the interior of said delivery conduit adjacent said aperture to at least partially fluidize said fluidizable material as it enters said delivery conduit through said aperture in said delivery conduit;

a hopper for holding said fluidizable material in fluid delivering relationship to said aperture through said delivery conduit;

a first flat stationary plate disposed on the outside of said conduit, said plate being provided with an apperture alignable with the aperture in said conduit;

a second flat plate rotatably mounted on top of said first plate, said second plate being provided with an aperture alignable with the aperture in said first plate, the degree of alignment between the apertures in said first and second plates being variable by rotation of said second plate;

a plurality of camlock lever bolts secured to the tank and adapted for attachment to prongs on said adaptor lid for selectively securing said adaptor lid to said tank.

4,511,292

PNEUMATIC SUCTION DEVICES FOR DISCHARGING GRANULATES

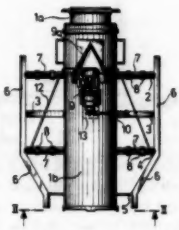
Theodor Hesse, and Hans Barkmeyer, both of Melle, Fed. Rep. of Germany, assignors to Engelbrecht & Lemmerbrock GmbH & Co., Melle, Fed. Rep. of Germany

Filed Dec. 20, 1982, Ser. No. 451,233

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151638

Int. Cl.³ B65G *53/42*

U.S. Cl. 406—152 **5 Claims**



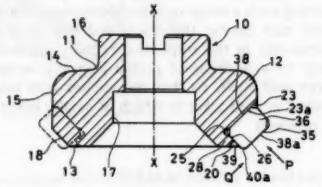
1. A pneumatic suction device for discharging granulates or other not readily flowable materials from ships, comprising a steerable jib, a suction pipe having a suction nozzle suspended from the steerable jib, a frame surrounding said suction nozzle in a spaced relationship therewith, which frame is formed of a plurality of flat bars arranged in a spaced relationship and being substantially parallel to the longitudinal axis of said suction nozzle and in a plane extending radially with respect to the longitudinal axis of said suction nozzle, and horizontally disposed rings, supported on said suction nozzle in an articulated manner, joining together said plurality of flat bars, and drive means comprising a crank motor mounted on said suction nozzle for placing said frame into horizontal oscillating motion so that said granulates or other not readily flowable materials are loosened for intake by suction by said suction nozzle.

4,511,293

INSERT CUTTER

Hiroshi Shimomura, Tokyo, and Tatsuo Arai, Kitamoto, both of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 454,100
Claims priority, application Japan, Dec. 29, 1981, 56-213170; Dec. 29, 1981, 56-213171; Mar. 15, 1982, 57-40499
Int. Cl.³ B26D 1/12
U.S. Cl. 407—41 6 Claims



1. A cutter for processing a surface of a metal workpiece which comprises:

(a) a body of a generally circular cross-section having an axis of rotation therethrough, said body being of a one-piece solid construction and having a forward end face, a rearward end face and a circumferential surface lying between said forward and rearward end faces, said body having a plurality of generally radially outwardly-opening recesses each formed with a predetermined width extending rearwardly and radially with respect to said circumferential surface, said recesses being in circumferentially spaced relation to each other and disposed adjacent said forward end face so that at least a portion of each of said recesses extends from the forward end face to the circumferential surface of said body, each of said recesses including a first bearing surface sloping radially outwardly in a direction away from said forward end face and extending to said circumferential surface, said recess also including means defining a second bearing surface sloping radially outwardly toward said forward end face, said second bearing surface being disposed forwardly of and extending toward said first bearing surface, said second bearing surface being disposed at a predetermined angle relative to said first bearing surface, so that said first bearing surface has a width extending rearwardly and radially less than the predetermined width of said recess;

(b) a plurality of cutter inserts received in said plurality of recesses, respectively, each insert being of a quadrilateral shape having four side faces, front and rear faces and four corners, two adjacent side faces being held in contact with said first and second bearing surfaces, respectively, said insert having an end cutting edge at the corner thereof at which the side face held against the said second bearing surface and the side face facing away from the said first bearing surface intersect each other, said end cutting edge extending slightly beyond said forward end face, and said insert having a peripheral cutting edge formed on the side face facing away from the said first bearing surface; and

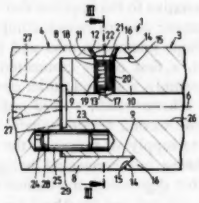
(c) a plurality of elongated clamp members received in said plurality of recesses, respectively, and releasably holding said inserts in position, each clamp member extending along said first bearing surface generally coextensive therewith.

4,511,294

ROTARY MATERIAL REMOVING TOOL

Manfred Grunsky, Dreieichenhain; Reiner Süssmuth, Neu Isenburg, and Günter Ischen, Oberhausen, all of Fed. Rep. of Germany, assignors to Stellram GmbH, Heusenstamm, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,639
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1982, 3204245
Int. Cl.³ B23B 51/00
U.S. Cl. 408—232 18 Claims



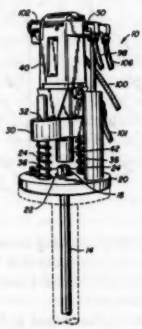
1. A material removing tool with a rotary support comprising an adapter arranged to support a cutter or the like and including two spaced-apart legs defining a socket and having edge faces, at least one of said legs having a hole extending substantially radially of said support; a shank including a stub extending into said socket and having a tapped bore extending substantially radially of said support, said shank further having surfaces each adjacent to a different one of said edge faces; and means for releasably securing said adapter to said shank, including a screw having a threaded shank portion threaded into said tapped bore, and a head in said hole, the axes of said hole and said bore being parallel and offset relative to one another so that the head of said screw cooperates with said one leg to urge said edge faces against the respective surfaces of said shank.

4,511,295

PNEUMATIC COLLET RELEASE TOOL

Vadim Razdobreev, 4150 Ohna Ct., Fremont, Calif. 94536

Filed Sep. 20, 1982, Ser. No. 419,895
Int. Cl.³ B23C 7/00
U.S. Cl. 409—233 3 Claims



1. A device for rotating a draw bar in a machine tool, said draw bar having one end operably connected to a collet and an opposite end adapted to be rotated, said device comprising:

a frame capable of being mounted on the machine tool near the opposite end of the draw bar;

a carriage slidably mounted on the frame so that it is free to

move toward and away from the opposite end of the draw bar;

a pneumatic motor mounted on said carriage, said motor having a first selector switch shaft for actuating the motor in a first rotational direction and a second selector switch shaft for actuating the motor in the opposite rotational direction;

means for engaging said rotating the opposite end of the draw bar, said means being operably connected to the motor;

a piston and cylinder assembly mounted to the machine tool and connected to the carriage to raise and lower te engaging means relative to the opposite end of the draw bar; and

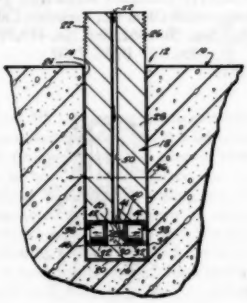
a single pneumatic control switch comprising (1) a housing having a single pneumatic inlet and four pneumatic outlets, to wit, a first outlet connected to the piston and cylinder assembly, a second outlet operatively connected to the first selector shaft, a third outlet operatively connected to the second selector shaft, and a fourth outlet connected to supply air power to the motor, and (2) two cylinders being interconnected between the inlets and outlets so that depressing one cylinder connects the inlet to the first, second and fourth of the outlets in order to simultaneously actuate the piston and cylinder assembly to lower the engaging means and depress the first selector switch to rotate said engaging means in a first direction, and depressing the second cylinder connects the inlet to the first, third and fourth of the outlets in order to simultaneously actuate the piston and cylinder assembly to lower the engaging means and depress the second selector switch to rotate said engaging means in a second direction, whereby the draw bar may be rotated in either direction.

4,511,296

ANCHOR BOLT WITH MECHANICAL KEYS DEPLOYED BY INTERNAL PRESSURIZATION

Israel Stol, Pittsburgh, Pa., assignor to Invocas, Inc., Columbus, Ohio

Filed Mar. 16, 1983, Ser. No. 475,716
Int. Cl.³ F16B *13/04*; B23P *19/00*
U.S. Cl. 411—20 **9 Claims**



1. An anchor bolt for providing an anchor site in a matrix of solid material which has an accessible face having a generally cylindrical socket formed therein through said accessible face, said anchor bolt comprising:

a shaft constructed and arranged to be snuggly received one end first into the socket so as to have an axially inner portion embedded in the matrix and an axially outer stub portion protruding outwardly of said accessible face;

means defining at least one cavity generally centrally within the axially inner portion of the shaft;

means defining a longitudinally extending passageway in said shaft, said longitudinal passageway extending from communication with said cavity, to the exterior of said stub portion of said shaft;

at least one respective radially extending passageway extending in said shaft between each said cavity and the exterior of said shaft axially inner portion;

a key of hard, durable material wholly recessed in each said radially extending passageway, each such key, said at least one cavity and said passageways being constructed and arranged for direct exposure of each such key to superatmospheric fluid pressure when applied to said at least one cavity, and being constructed and arranged for direct, engaging penetration of said matrix upon being driven radially outwardly; and

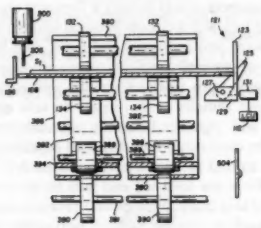
means, operable via said longitudinal passageway, for producing such a surge of superatmospheric fluid pressure in each said cavity, that each said key is driven radially outwardly in the respective radially extending passageway to a position of partial-length protrusion radially from said shaft, so that the anchor bolt may be firmly locked in the socket in which its axially inner end portion is received.

4,511,297

APPARATUS AND METHOD FOR OFFSETTING AND DELAYING DELIVERY OF SHEETS IN AN ADHESIVE BINDER

William C. Wilson, and Michael H. Green, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 23, 1982, Ser. No. 422,069
Int. Cl.³ B42B *5/00*; B05B *1/28*; B42C *9/00*
U.S. Cl. 412—8 **9 Claims**



1. In an adhesive binder for forming bound booklets from sets of sheets, the binder having means for applying liquid adhesive to a side edge portion of one or more sheets of each set of sheets, a tray where sheets of each set are assembled to form a bound booklet, and means for advancing the sheets seriatim toward the assembly tray, the improvement comprising:

means for temporarily stopping advancement of the first and second sheets of a set after such sheets have completely passed the adhesive applying means and before such sheets reach the tray so that there is a brief period of time for removing a booklet from the tray before sheets of the next booklet are advanced to the tray; and

means for offsetting the first and second sheets so that when such sheets are stopped by the stopping means adhesive on one sheet is spaced from the side edge of the other sheet, thereby to avoid removal of adhesive from said one sheet.

4,511,298

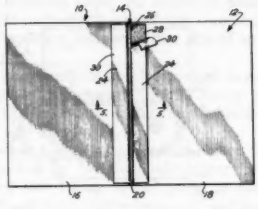
PROTECTIVE BINDER

Charles E. Jones, Evanston, Ill., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,765
Int. Cl.³ B42B *5/06, 5/00*; B42F *13/00*; B42C *9/08*
U.S. Cl. 412—34 **6 Claims**

1. A protective binder for holding and protecting one or

more pages containing information and the like thereon, said binder comprising a unitarily formed and foldable semi-rigid member, said foldable member having a front cover, a back cover, and a contiguous rear edge section between said front and back covers, hinge defining means unitarily formed by said foldable member for flexibility interconnecting both said front cover and said back cover to said rear edge section, said rear edge section having an interior surface, elongated flexible tape



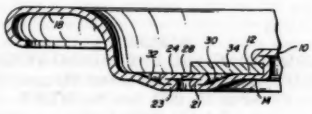
means having a central portion thereof bonded to said interior surface of said rear edge for substantially the entire length of said tape and said rear edge and having a projecting edge portion adjacent said central portion overlapping at least one of said covers said tape having bonding means for securely receiving said pages, said tape being free of said bonding means on the surface thereof adjacent said overlapped cover, said pages being securely received by said bonding means on said tape for securement between said front and back covers.

4,511,299

PULL-TAB FORMING METHOD

Edgar H. Zysset, St. Cloud, Fla., assignor to Automated Container Corporation, Orlando, Fla.

Filed Sep. 1, 1983, Ser. No. 528,584
Int. Cl.³ B21D *51/00*
U.S. Cl. 413—12 **9 Claims**



1. A method for forming a container having a pull-tab removable end, said method comprising the steps of:

(a) providing a can end having a peripheral edge and a generally flat panel, said panel having opposing first and second sides with said first side adapted to face toward the inside of the container when said end is affixed thereto;

(b) forming first and second concentric grooves in said panel spaced from said peripheral edge, said grooves extending below the level of said first side to form inner and outer beads;

(c) forming a central bead in said panel between said first and second concentric grooves, said central bead extending above the level of said second surface;

(d) forming a score along said central bead;

(e) forcing said inner and outer beads toward each other and then toward said first surface and said central bead toward said second surface until said inner and outer beads abut said central bead; and

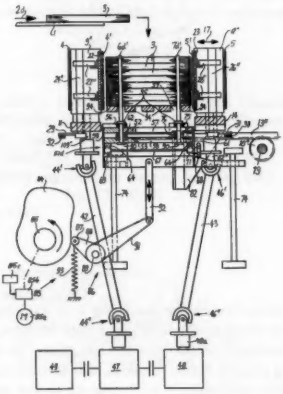
(f) fixing a pull-tab to said end, said pull-tab having means for severing said end along said score.

4,511,300

APPARATUS FOR GATHERING WRITING PADS OR THE LIKE

Siegfried Lampe, Ellerbek; Heinz Lehmann, and Peter Dose, both of Hamburg, all of Fed. Rep. of Germany, assignors to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 269,563, Jun. 2, 1981, Pat. No. 4,403,899. This application Sep. 13, 1983, Ser. No. 531,919
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1980, 3021124
The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.
Int. Cl.³ B65H *31/30*
U.S. Cl. 414—35 **10 Claims**



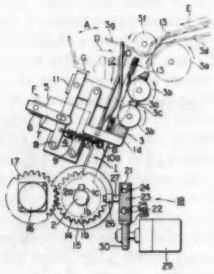
1. Apparatus for gathering stacks of pads or analogous commodities, comprising a row of neighboring receptacles having a floor; means for feeding commodities into said receptacles so that the receptacles accumulate stacks of commodities; and means for removing the stacks from said receptacles, including first and second conveyor means flanking said row, each of said conveyor means comprising an endless flexible element and upright rotary guide members for such flexible element, each of said flexible elements having an elongated reach adjacent to the respective side of said row, at least a portion of at least one of said conveyor means being shiftable between a first position nearer to the other of said conveyor means to thereby establish motion transmitting contact between the stacks and said conveyor means and a second position distant from said other conveyor means, means for shifting said portion of said one conveyor means between said first and second positions including means for moving said reach of said one conveyor means toward and away from said other conveyor means, said moving means including a reciprocable back support adjacent to that side of the respective reach which faces away from said row, and means for advancing said conveyor means to remove the stacks from said receptacles in the longitudinal direction of said row on movement of said portion of said one conveyor means to said first position.

4,511,301

CLAMP DEVICE FOR PAPER SHEET BUNDLES IN A PAPER SHEET COUNTING AND BANDSEALING APPARATUS

Hikaru Kawano, Odawara; Koji Sato, Hiratsuka, and Hiroyoshi Nogi, Tokyo, all of Japan, assignors to Musashi Co., Ltd., Tokyo and Hitachi Engineering Kabushiki Kaisha, Kanagawa, both of, Japan

Filed Dec. 14, 1983, Ser. No. 561,562
Claims priority, application Japan, Dec. 22, 1982, 57-223924
Int. Cl.³ B41J *13/10*; B65H *31/30*
U.S. Cl. 414—43 **2 Claims**



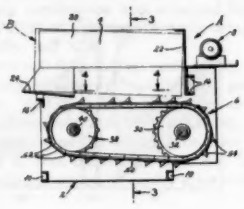
1. A clamp device for receiving and stacking paper sheets fed thereto sequentially in edge-to-edge relation, comprising a stacker member including a stacker piece having a laterally projecting stacker block thereon, said stacker block extending substantially transversely with respect to the path of said fed paper sheets for impingement by, and support of the leading edges of said sheets as they are received and stacked in said lateral direction in said stacker member, said stacker piece having a concavely curved paper sheet receiving surface and means defining a through-hole of said surface, said stacker piece being movable between a first position thereof wherein its said surface is substantially adjacent to the path of said fed paper sheets and a second position thereof which is displaced from its said first position in said lateral direction, the curvature of said concavely curved surface being substantially in the direction of feeding of said paper sheets, a roll-holding member in fixed position adjacent to said first position of said stacker piece and carrying a pair of parallel rotatable rolls which project through said through-hole of said stacker piece and are disposed substantially tangent to the path of said fed paper sheets when said stacker piece is in its said first position, said rolls being rotatable in said direction of feeding of said sheets, a driving member mounted for movement toward and away from said stacker piece and having a convexly curved pressing surface corresponding with, and facing said concavely curved stacker piece surface and said rolls when said stacker piece is in its said first position for receiving and stacking said fed paper sheets in substantially straight condition between said pressing surface and said rolls, and means operable upon attaining the desired stack of said paper sheets for urging said driving member toward said stacker piece and for moving said stacker piece from its said first position and away from said rolls to its said second position to clamp said stacked sheets in curved condition between said convexly curved driving member surface and said concavely curved stacker piece surface as said stacker piece is moved to its said second position.

4,511,302

MACHINE FOR DISLODGING CANS FROM A COMPRESSED BALE OF CANS

Joseph Moore, St. Louis, Mo., assignor to Hustler Conveyor Company, St. Louis, Mo.

Filed Apr. 1, 1983, Ser. No. 481,571
Int. Cl.³ B65G *65/42*
U.S. Cl. 414—327 **11 Claims**



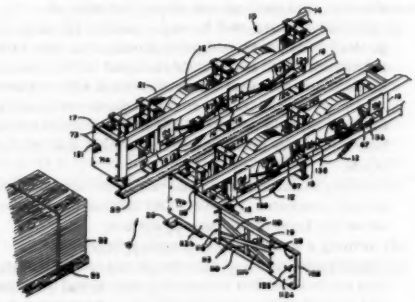
3. A machine for dislodging items from a densified bundle of such items, said machine comprising: a frame; an endless track supported on the frame such that it has one pass which is presented upwardly; means supported on the frame for moving the track relative to the frame without changing its location on the frame; lugs attached to the track such that they project outwardly therefrom, whereby the lugs project generally upwardly along said one upwardly presented pass of the track; and walls mounted on the frame to provide a cavity above said one pass of the track, said walls including a front wall which extends over and across said one pass of the track such that said one pass for the most part moves toward and beneath the front wall, said walls also including side walls which extend rearwardly from the front wall generally along the sides of said one pass, the cavity being open at its top and also between the side walls at their ends that are remote from the front wall, so that the cavity opens both upwardly and rearwardly, whereby a densified bundle of items may be inserted into the rear open end of the cavity and deposited on said one pass of the track, so that the lugs urge the bundle toward the front wall and strip the items from the bottom of the bundle, enabling them to be carried out of the cavity on the track.

4,511,303

SELF-LOADING AND UNLOADING VEHICLE

William B. O'Neill, P.O. Box 1144, Fort Morgan, Colo. 80701

Filed Sep. 13, 1982, Ser. No. 417,355
Int. Cl.³ B60P *3/00*
U.S. Cl. 414—458 **3 Claims**



1. A transport trailer releasably connected to and pulled by a tractor, said trailer adapted to automatically load and unload

at least one object supported at a raised position, comprising in combination:

an elongated, generally U-shaped frame having a closed end and an open end and two elongated arms defining an opening therebetween and extending rearwardly from the closed end to the open end, each arm terminating at the closed end in a cap plate having a plurality of prealigned holes formed therein, one of said cap plates having another hole formed therein, each of said arms further including a plurality of box structures spaced at predetermined positions along the length of each arm, each box structure including two vertical members and two horizontal members defining either side of an opening in said arms;

at least one wheel rotatably connected to each of said arms for allowing movement of said frame as said frame is pulled by the tractor, each of said wheels mounted within one of said openings;

lifting means for picking up said object from said raised position and for lowering said object to a second raised position, said lifting means being mounted on selected ones of said horizontal members of said box structures and operably connected to a tine extending substantially the length of each of said arms and generally adjacent the opening defined between said arms;

transverse structure pivotably connected to one of said arms at the open end thereof, said transverse structure including at least two vertical members at either lateral end thereof and two horizontal members at a bottom and a top thereof, each end of said transverse structure at each of the vertical members further including a closure plate connected to said vertical and horizontal members for mated contact with said cap plates on closure of said transverse structure against said arms, one of said closure plates nearest the pivotable connection to said one arm further having a plurality of pins joined thereto in a vertical column, said pins being of generally cylindrical shape and terminating in a frustoconical portion adapted to be received into and project through the prealigned holes on the one like shaped cap plate at the end of the one arm, the other closure plate of said transverse structure including two vertical columns of identically shaped pins adapted to be received into and project through the prealigned holes formed in the other cap plate and a slot formed in said other closure plate; and

locking and closing means for pulling said transverse structure into a closed position wherein the cap plates are face-to-face with the closure plates, the pins of the closure plates projecting into the holes of the cap plates at the ends of the arms, said locking and closure means further including a piston and cylinder pivotably connected to the end of the other arm, said piston being integrally connected to a key, which key extends through the hole in said one cap plate for receipt of the slot in the other closure plate on the transverse structure, said key being of generally T-shaped configuration for initial insertion into and then rotation with respect to said slot to thereby close and lock said transverse structure upon activation of said piston cylinder.

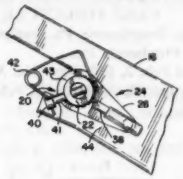
4,511,304

LATCH FOR SECURING REEL CARRYING SPINDLES TO A LOADING AND UNLOADING MECHANISM

Roger D. Woodruff, Hebron, Ind., assignor to Champion Corporation, Hammond, Ind.

Filed Sep. 7, 1982, Ser. No. 415,134
Int. Cl.³ B65H *75/40*
U.S. Cl. 414—546 **14 Claims**

1. In a mechanism for moving structures relative to a supporting bed, the mechanism including pivotally mounted arms having recesses defined at one end of said arms, rod means carried by the structures for engagement with said recesses in the arms whereby pivoting movement of the arms operates to lift the structures, and means for locking said rod means in engagement with said recess in each arm, the improvement in said locking means comprising a latch mechanism having a plate-like body having a completely enclosed aperture therein, said aperture dimensioned to receive said rod means there-



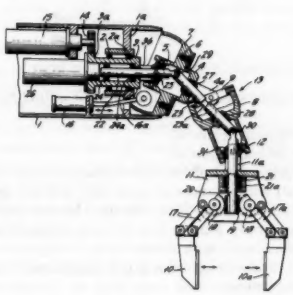
through, and manually operable means for releasably attaching said body to said arm, to prevent translational movement of said body in a plane perpendicular to said rod means, wherein said latch when engaged with said arm and said rod means retains said rod means within the recess of said arm.

4,511,305

MANIPULATOR

Seiji Kawai, Tokyo, and Dairiku Matsumoto, Higashi minemachi, both of Japan, assignors to Meidensha Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1983, Ser. No. 457,590
Claims priority, application Japan, Jan. 16, 1982, 57-5105
Int. Cl.³ B66C *1/10*
U.S. Cl. 414—755 **3 Claims**



1. A manipulator having a base, a hand, and flexible arm means, said flexible arm means comprising: a plurality of hollow coupling members including one adjacent the base, first universal joint means respectively coupling said hollow coupling members to each other so as to allow free flexion and integral rotation thereof, said one hollow coupling member being attached rotatably to said base, first actuator means housed in said base for rotating said one hollow coupling member, a frame mounted rotatably on the hollow coupling member adjacent said one hollow coupling member, a plurality of hand operating shafts including one adjacent said base, spherical bearings attaching said hand operating shafts to said hollow coupling members so as to allow relative rotation therebetween, second universal joint means respectively at intermediate locations of said hollow coupling members for coupling said hand operating shafts to each other, said one hand operating shaft being attached rotatably in said one hollow coupling member, and being connected at one end to an operating shaft for operating said hand, at least another one of said hand operating shafts being expandable, second actuator means attached to said one hollow coupling member for rotating said hand operating shafts, and third actuator means con-

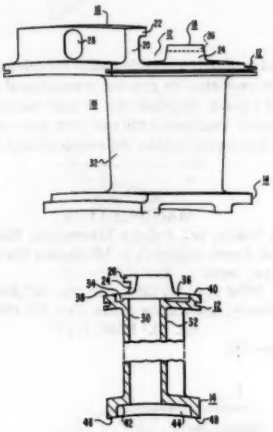
nected to said frame for tilting said frame so as to flex said flexible arm means.

4,511,306

COMBUSTION TURBINE SINGLE AIRFOIL STATOR VANE STRUCTURE

Kent G. Hultgren, Swarthmore, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 2, 1982, Ser. No. 345,125
Int. Cl.³ F01D *9/02, 9/04*
U.S. Cl. 415—136 **1 Claim**



1. A one-piece cast stator structure for a fluid turbine, comprising:

an inner shroud segment;

an outer shroud segment;

a single, generally hollow, airfoil-shaped stator vane having one wall with a concave outer face, and an opposite wall with a convex outer face, said vane having opposite radial ends integrally joining said shroud segments through an investment casting process;

said vane walls being of a given thickness throughout its hollow portion;

the wall thickness of at least one of said shroud segments, in the general vicinity of the intersection between said at least one shroud segment and the hollow wall portion of the vane, is of substantially reduced thickness relative to the wall thickness of said at least one shroud segment along its side margins, so as to provide a closer match in thickness between said vane wall given thickness and said reduced thickness than between said given thickness and said shroud side margin thickness;

upstream and downstream support rail means on the outer face of said outer shroud segment for connecting said stator sturcture to blade ring means;

means for securing said upstream rail means to said blade ring means to restrain relative movement in the circumferential and axial directions while permitting limited relative movement in the radial direction;

said blade ring means includes groove means receiving said downstream rail means, and said groove means and rail means are dimensioned to provide one clearance permitting limited relative movement therebetween in a radial direction; and

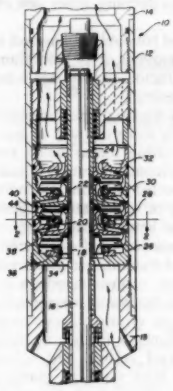
the downstream end of said outer shroud carrying said downstream rail has an arc on its portion facing said blade ring means of a shorter radius than the radius of said facing blade ring means to provide another clearance at the circumferential ends of said outer shroud in the order of two to three times larger than said one clearance.

4,511,307

CENTRIFUGAL PUMP

Eldon L. Drake, Shawnee, Okla., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 2, 1983, Ser. No. 529,058
Int. Cl.³ F04D *29/02, 29/04*
U.S. Cl. 415—172 R **6 Claims**



1. In a centrifugal pump useful in pumping sand laden fluids, said pump including a rotatable impeller and a fixed diffuser, improved bearing means comprising:

an annular thrust member constructed from a material having a hardness greater than the hardness of sand, said member being attached to said impeller and having a bearing surface; and

an annular second member constructed from a material having a hardness greater than the hardness of sand, said second member being attached to said diffuser and having a bearing surface disposed in juxtaposition with the bearing surface on said thrust member to absorb thrust loading of said impeller, and whereby sand coming between said bearing surfaces will not erode said surfaces thereby prolonging the useful life of said pump when used for pumping fluids containing sand.

4,511,308

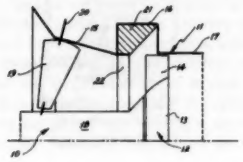
AXIAL AND MIXED FLOW FANS AND BLOWERS

Bruce A. Russell, Queenscliffe, and Adnan M. Abdel-Fattah, Blacktown, both of Australia, assignors to James Howden Australia Pty. Limited, North Sydney, Australia

PCT No. PCT/AU81/00181, § 371 Date Jul. 14, 1982, § 102(e) Date Jul. 14, 1982, PCT Pub. No. WO82/01919, PCT Pub. Date Jun. 10, 1982
PCT Filed Dec. 3, 1981, Ser. No. 403,493
Claims priority, application Australia, Dec. 3, 1980, 6741/80
Int. Cl.³ F04D *29/52*
U.S. Cl. 415—191 **9 Claims**

1. A high pressure axial or mixed flow blower or suction fan, comprising: an elongate tubular casing, an impeller disposed within said casing and having a hub rotatable about a longitudinal axis of the casing, and also having a plurality of blades extending radially from said hub, each blade having a tip with a leading edge and a trailing edge, a stationary center tube positioned within said casing upstream of the hub and carrying a plurality of guide vanes extending radially therefrom, the casing comprising a tubular inlet portion the cross sectional area of which is constant or is reduced gradually along its

length and which extends at least from the guide vanes in a downstream direction until it terminates in a tubular intermediate portion of larger cross sectional area than the inlet portion at its point of termination, the intermediate portion in turn terminating in a tubular outlet portion which is no larger in cross sectional area than the inlet portion at its point of termination, the inlet portion and the intermediate portion being



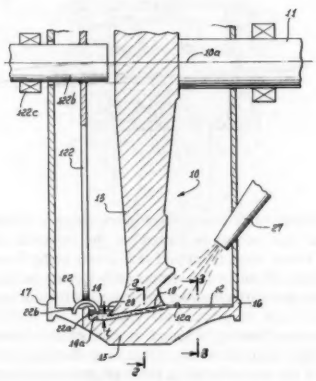
connected by an imperforate and substantially annular first wall portion and the intermediate portion and the outlet portion being connected by an imperforate and substantially annular second wall portion, the impeller being so positioned that the leading edge of the tip of each blade is positioned within the intermediate portion while the trailing edge thereof is positioned within the outlet portion.

4,511,309

VIBRATION DAMPED ASYMMETRIC ROTOR CARRYING LIQUID RING OR RINGS

James P. Maddox, Sherman Oaks, Calif., assignor to Transamerica Delaval Inc., Lawrenceville, N.J.

Filed Jan. 10, 1983, Ser. No. 457,005
Int. Cl.³ F01K *25/06*
U.S. Cl. 415—202 **11 Claims**



1. In apparatus of the character described, the combination comprising

(a) a rotor defining an annular channel to receive liquid that rotates with the rotor about the axis thereof, said channel including first and second sections which are axially spaced apart and intercommunicate via at least one drainage path via which liquid flows from the first channel section to the second channel section, the bottom of the second channel section spaced further from said axis than the bottom of the first channel section;

(b) nozzle means to jet fluid including liquid toward the first channel section which collects liquid in a film on the bottom of the first channel section, and

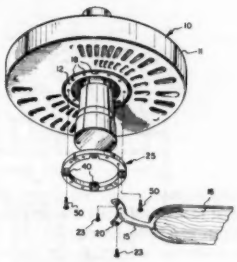
(c) means removing liquid from the second channel section so that liquid depth in said film in the first channel section is controlled, and so that liquid depth in the second channel is kept below a selected minimum value, thereby to inhibit surge wave development that otherwise is productive of rotor vibration during such rotor and liquid rotation, the rotor defining a lip at the side of said second section furthest from said first section, the radius of said lip from said axis approximating the radius to the bottom of the first section.

4,511,310

CEILING FAN BLADE ISOLATION

Richard A. Pearce, Memphis, Tenn., assignor to Robbins & Myers, Inc., Dayton, Ohio

Filed Mar. 2, 1984, Ser. No. 585,745
Int. Cl.³ F04D *29/64*
U.S. Cl. 416—134 R **5 Claims**



1. A ceiling fan having an electric drive motor including a rotor cage, and in which a plurality of paddle-like fan blades are mounted on blade irons for driving by the rotor cage, the improvement comprising:

a plurality of rigid suspension and drive elements depending from said rotor cage,

an annular blade-mount member,

means on said blade-mount member for mounting said blade irons in arcuately spaced relation to each other,

a plurality of elastomeric grommets each having an axial opening therethrough,

means mounting said annular blade-mount member to said grommets, and

means mounting said grommets to said suspension and drive elements for supporting said blade mount member in spaced relation to said cage, said suspension and drive elements further comprising partially threaded headed studs, one for each said grommet, said studgs received through said grommet openings with the heads thereon on one side of the associated said grommet and supporting said annular blade-mount member and said grommets in depending spaced relation to the rotor cage.

4,511,311

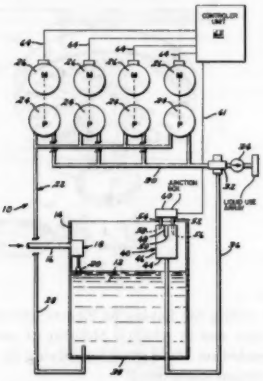
FLUID SYSTEM CONTROL APPARATUS AND METHOD

John T. Olson, Edina, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Sep. 1, 1982, Ser. No. 413,628
Int. Cl.³ F04B *41/06*
U.S. Cl. 417—5 **9 Claims**

1. In combination with a fluid distribution system including a reservoir containing a supply of fluid, a fluid supply line conveying fluid from the reservoir to an implement using the fluid at a variable rate, a plurality of pumps for moving fluid through the supply line, a flow regulator interposed in the supply line to control the amount of fluid delivered to the implement, and a fluid return line channeling fluid diverted from the supply line by the regulator back to the reservoir; apparatus for governing flow of fluid from the reservoir through the supply line, comprising:

(a) means for measuring volumetric rate of flow of fluid through the return line, said measuring means comprising:
(i) a weir chamber having an aperture with a vertical dimension formed in a side thereof;
(ii) means for conducting fluid in the return line into said chamber, the fluid entering said chamber below a lower extremity of said aperture and rising to a height within said chamber depending upon the volumetric rate of fluid flow in the return line;
(iii) first sensing means disposed for perceiving rising of fluid along said vertical dimension of said aperture to a first height corresponding to the quantity of fluid exceeding that minimum quantity needed by the implement by said first designated amount; and



(iv) second sensing means disposed for perceiving rising of fluid along said vertical dimension of said aperture to a height corresponding to the quantity of fluid exceeding that minimum quantity needed by the implement by said second designated amount; and
(b) means, responsive to the measured volumetric rate of fluid flow through the return line, for activating at least one additional pump, as necessary, in order to provide at least a quantity of fluid exceeding a minimum quantity needed by the implement by a first designated amount, to the regulator, and for deactivating at least one pump, as necessary, when the amount of fluid delivered to the regulator exceeds the minimum amount of fluid needed by the implement by a second designated amount.

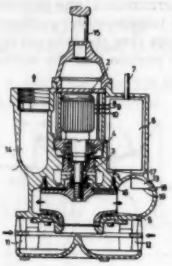
4,511,312

METHOD OF DRIVING THE IMPELLER OF A LIQUID PUMP BY MEANS OF A BRUSHLESS A.C. MOTOR; AND A LIQUID PUMP FOR CARRYING OUT THE METHOD

Carl S. M. Hartwig, Täby, Sweden, assignor to Institut Cerac S.A., Ecublens, Switzerland

Filed Jun. 1, 1983, Ser. No. 499,980
Claims priority, application Switzerland, Jul. 28, 1982, 4578/82
Int. Cl.³ F04B *49/06*
U.S. Cl. 417—45 **11 Claims**

3. A liquid pump comprising: an impeller (5), a pump housing (1) for housing said impeller (5), a brushless a.c. motor (2) for driving said impeller, a regulatable static inverter (6) for supplying electric power to said motor (2) and having an output frequency in the order of 100–1000 Hz, means (86,87) for changing the output frequency of the inverter so that substantially constant power (P_{max}) is delivered to the motor irrespective of the load on said motor.

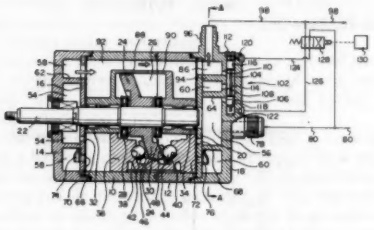


4,511,313

COMPRESSION CAPACITY CONTROL APPARATUS FOR SWASH PLATE COMPRESSOR

Yutaka Ishizuka, and Tsunenori Shibuya, both of Konan, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Sep. 1, 1982, Ser. No. 413,642
Claims priority, application Japan, Sep. 11, 1981, 56-143525
Int. Cl.³ F04B *49/02, 49/00, 1/16, 1/18*
U.S. Cl. 417—270 **8 Claims**



1. A swash plate compressor comprising a cylinder block, front and rear covers mounted on the opposite ends of the cylinder block, each front and rear cover being formed with a low pressure chamber for temporarily storing an incoming gas and a high pressure chamber for temporarily storing an outgoing gas,
a delivery chamber formed in one of the front and rear covers, conduit means extending through said cylinder block for commincating the high pressure chamber in the other cover with the delivery chamber, wall means isolating the delivery chamber from the high pressure chamber in said one cover, a delivery conduit delivering outgoing gas from said delivery chamber;
a compression capacity control passageway providing communication between the delivery chamber and the high pressure chamber in said one cover and communication between the high and low pressure chambers in said one cover; and
a valve member comprising a valve spool disposed in the control passageway and operable in a first position to block communication between the high pressure chamber and the low pressure chamber of said one cover while unblocking communication between the delivery chamber and the high pressure chamber of said one cover and operable in a second position to block communication between the delivery chamber and the high pressure

chamber of said one cover while unblocking the communication between the high pressure chamber and the low pressure chamber of said one cover,

said valve spool being formed with a first land for selectively communicating the delivery chamber with the control passageway and a second land for selectively communicating the low pressure chamber of said one cover with the control passageway, whereby when said valve member is in said second position, the gas in said high pressure chamber in said other cover continues to pass to said delivery chamber and out to said delivery conduit while the gas in said high pressure chamber in said one cover is precluded from passing to said delivery chamber and passes to the low pressure chamber in said one cover to thereby reduce the total capacity of the compressor without requiring any check valve between the high pressure chambers in the front and rear covers and the delivery conduit.

4,511,314

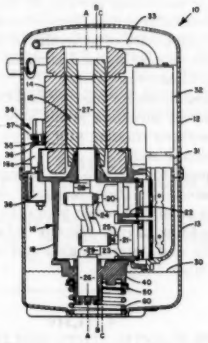
MOUNTING FOR A HERMETIC COMPRESSOR

Howard H. Fraser, Jr., Lafayette, and George A. Anderson, III, East Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 14, 1984, Ser. No. 609,616

Int. Cl.³ F25D *19/00*

U.S. Cl. 417—363 **6 Claims**



1. A mounting for vertically supporting an asymmetrical motor-compressor unit having a center of gravity spaced from the axis of rotation of the crankshaft within the shell of a hermetic compressor serially comprising:

bearing head means;

positioning plate means; and

spring means;

said bearing head means being adapted to receive the crankshaft of a motor-compressor unit in a journal relationship and including an axial extension, a pair of axially extending bosses and at least one axially extending arcuate rim portion;

said positioning plate means having a first opening for receiving said axial extension and at least two additional openings for receiving said pair of bosses;

said spring means adapted to surround said axial extension and to biasingly engage said plate means and the shell and having a geometric center coaxial with the center of gravity of the compressor whereby a stable support is provided.

4,511,315

LIQUID METAL MECHANICAL PUMP

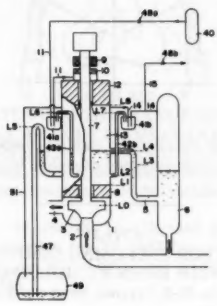
Mitsuru Kanbe, Yokohama, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 479,077

Claims priority, application Japan, Mar. 30, 1982, 57-52158

Int. Cl.³ F04B *39/02;* **F01D** *25/08*

U.S. Cl. 417—366 **8 Claims**



1. A mechanical pump for liquid metal, including a drive shaft housing having therein a free surface of liquid metal and a cover gas space over said liquid metal free surface, a gas line for feeding a cover gas into said cover gas space, and a gas line for exhausting the cover gas from said cover gas space, said mechanical pump further comprising:

an emergency cover gas line shut-off system;

wherein said gas feed line is cut at the outside of and in the proximity of said drive shaft housing, resulting open ends of the gas feed line being inserted into a first air-tight freeze pot so as to communicate with each other via said first freeze pot;

wherein said gas exhaust line is cut at the outside of and in the proximity of said drive shaft housing, resulting open ends of the gas exhaust line being inserted into a second air-tight freeze pot so as to communicate with each other via said second freeze pot; and

wherein said first and second freeze pots each being connected to said drive shaft housing via a first freeze pot pipe and a second freeze pot pipe, respectively, through which the liquid metal in said drive shaft housing flows out into said first and second freeze pots when the free surface of the liquid metal inside the drive shaft housing rises to a predetermined level higher than the level of the normal operation of the pump.

4,511,316

POSITIVE DISPLACEMENT PUMPS

Bryan E. Ellis, Eastbourne, England, assignor to SSP Pumps Limited, England

Filed Jul. 1, 1982, Ser. No. 394,334

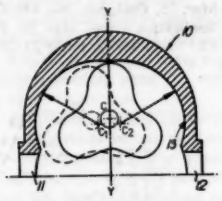
Claims priority, application United Kingdom, Jul. 3, 1981, 8120637

Int. Cl.³ F01C *1/18;* **F04C** *2/00*

U.S. Cl. 418—150 **4 Claims**

1. A rotary lobe positive displacement pump comprising two externally driven lobed impellers to contra-rotate within a casing without, in normal use, mutual contact or contact with the casing, the casing having two ports to act respectively as an inlet and an outlet, said ports being positioned on an axis extending intermediate said impellers and being perpendicular to a line joining the rotational axis of the impellers, the casing having two impeller chambers, each chamber being peripherally defined by two arcs, one of the arcs of each chamber being centered at a point offset from the nominal rotational axis of the associated impeller, the offset of said point from said rota-

tional axis being in a direction having one component parallel to the line joining the axes of the impellers and extending



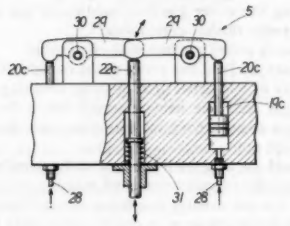
towards the other impeller and another component parallel to the center lines of the ports and extending towards one of said ports.

4,511,317

APPARATUS FOR ENCLOSING SEMICONDUCTORS WITH RESIN BY MOLDING

Kazuo Bandoh, No. 81-8, Toyama, Momoyama-cho, Fushimi-ku, Kyoto-shi, Japan

Filed Dec. 3, 1982, Ser. No. 446,699
Claims priority, application Japan, Dec. 7, 1981, 56-182748
Int. Cl.³ B29G *3/00*
U.S. Cl. 425—116 **3 Claims**



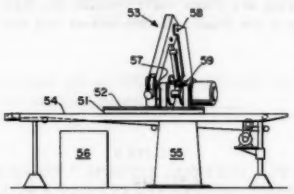
1. An apparatus for enclosing semiconductors with resin by molding comprising a stationary upper mold and a movable lower mold opposed thereto, a plurality of cavities formed in the mold surfaces of said upper and lower molds, a pluraltiy of pots in said upper mold, each of said pots being disposed so as to communicate with a predetermined number of said cavities without through main and auxiliary runners and including openings at the uper end thereof for receiving the resin, a plunger in each of said pots for pressurizing the resin received in the associated pot and for forcing the pressurized resin into said cavities and a resin material pressurizing mechanism disposed above said upper mold, said resin material pressurizing mechanism comprising a plurality of pistons and cylinders individual to but separate from said plungers and a like plurality of rocker arms disposed between individual pairs of said pistons and plungers for transmitting movement of a said piston into movement of the corresponding plunger, said cylinders being connected to individual channels for a fluid pressure medium, said plungers being arranged in a row in a plunger mounting frame and said cylinders being formed in said plunger mounting frame and arranged in two rows in staggered relationship on opposite sides of the row of plungers, sad rocker arms being located between the associated piston and plunger such that the opposite ends of each rocker arm contact the upper ends of the associated piston and plunger, and said rocker arms being mounted on swing shafts arranged in staggered rows on opposite sides on the row of plungers, said apparatus further comprising a plurality of biasing springs, located in the plunger mounting frame and individually associated with a corresponding one of said plungers, for biasing said plungers upwardly to an inoperative position thereof.

4,511,318

DOUGH ROLLING APPARATUS FOR LAMINATED COOKIES

Michael S. Kolodesh; Edward L. Peters, and Raymond J. Madgett, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 475,772, Mar. 16, 1983, abandoned. This application Feb. 21, 1984, Ser. No. 579,837
Int. Cl.³ B29D *7/10*; A21C *3/04, 7/01, 7/04*
U.S. Cl. 425—133.1 **10 Claims**



1. An apparatus for making a generally spherical laminate dough preform that has a first inner dough substantially uniformly encapsulated by at least one outer dough, said apparatus comprising:

(a) means for creating a laminate dough preform comprising a first inner dough having a layer of a second outer dough covering a substantial portion of said first inner dough, said layer of outer dough being of non-uniform thickness;

(b) a closed-top cavity of generally circular shape;

(c) means for supporting said laminate dough preform beneath said closed-top cavity;

(d) suspension means for moving said closed-top cavity in a predetermined direction about a predetermined axis of rotation without rotating said cavity relative to said suspension means; and

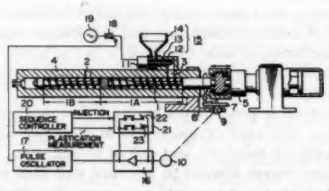
(e) drive means for moving said suspension means in said predetermined direction, whereby said laminate dough preform is caused to rotate about the interior surfaces of said closed-top cavity, thereby substantially uniformly distributing said outer dough about the entire surface of said first inner dough.

4,511,319

VENT-TYPE PLASTICATION MOLDING MACHINE

Seizo Takayama, Ube, Japan, assignor to UBE Industries, Inc., Japan

Filed Aug. 20, 1982, Ser. No. 409,943
Claims priority, application Japan, Aug. 24, 1981, 56-124090[U]
Int. Cl.³ B29F *1/06*
U.S. Cl. 425—145 **7 Claims**



1. A vent-type plastication molding machine comprising a material supply means provided at a material supply port communicating with a base end of an injection screw to feed mate-

rial at various rates, a speed detecting means for detecting a reciprocal sliding speed of said screw, and a material supply speed control means for changing or controlling the material supply speed of said material supply means so as to correspond to the reciprocal sliding speed of the injection screw at an injection stroke and a plastication measurement stroke.

4,511,320

EXTRUDER WITH A CASSETTE FILTER FOR MOLTEN PLASTIC MATERIAL

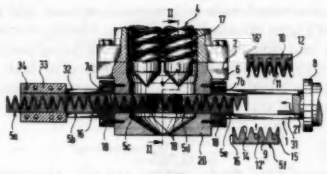
Friedrich Lambertus, Stuttgart, Fed. Rep. of Germany, assignor to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Mar. 19, 1984, Ser. No. 590,785

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309505

Int. Cl.³ B29F *3/04*; B01D *27/06*

U.S. Cl. 425—199 **19 Claims**



1. A cassette filter for melt discharged from an extruder, said filter comprising a plurality of successive elements each having a tooth-shaped profile with respective flanks, filter means covering the flanks of the tooth-shaped profile and means fitted in the tooth-shaped profiles of said elements for sandwiching said filter means between the tooth-shaped profiles of said elements and the means which is fitted into the tooth-shaped profiles, said successive elements inclusive of said means which is fitted into said tooth-shaped profiles having aligned bores for passage of melt therethrough and through said filter means.

4,511,321

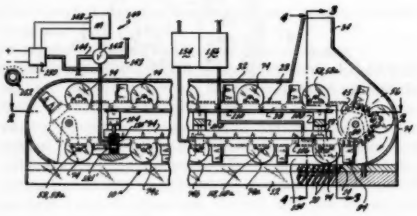
DENSIFICATION - PELLETIZING OF ORGANIC MATERIALS

Glenn Howard, 9893 Hwy. 41 N., Madera, Calif. 93637

Filed May 19, 1982, Ser. No. 379,663

Int. Cl.³ B28B *5/00*

U.S. Cl. 425—331 **13 Claims**



1. A machine for densifying and pelletizing extrudable material comprising, in combination, a flat horizontal die plate having spaced extrusion orifices in it, means for delivering material to be densified and pelletized to the surface of said die plate, pressure exerting means overlying said die plate for exerting pressure downwardly directly against the material for densifying it and for causing the material to be pelletized by being extruded through the die plate orifices, said pressure exerting means including continuous chain means positioned over said die plate, said chain means carrying a plurality of spaced pressure members shaped to cause the material to be densified to be extruded through the orifices in said die plate.

4,511,322

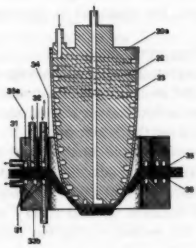
APPARATUS FOR THE MANUFACTURE OF A CUP-LIKE ARTICLE FROM POLYETHYLENE TEREPHTHALATE OR SIMILAR MATERIAL

Kjell M. Jakobsen, Skanor, and Clees T. Nilsson, Loddekopinge, both of Sweden, assignors to PLM Aktiebolag, Malmo, Sweden

Division of Ser. No. 154,890, May 30, 1980, Pat. No. 4,381,279. This application Jan. 10, 1983, Ser. No. 457,055

Int. Cl.³ B29C *17/03*, *17/04*

U.S. Cl. 425—384 **8 Claims**



1. Apparatus for the manufacture of a cup-like article from polyethylene terephthalate or similar material comprising clamping means for clamping a substantially flat blank of amorphous, polyethylene terephthalate or similar material in a peripheral region thereof to form an inner zone completely surrounded by an outer clamped zone, press means for engaging said inner zone of said blank in a central region thereof smaller than the total area of said inner zone whereby a band-like zone is formed between said outer clamped zone and the central region in contact with said press means, said band-like zone having a radial extent substantially greater than the thickness of said blank, means for effecting relative displacement between said press means and said clamping means, means for maintaining the temperature of said blank below the glass transition temperature (Tg) of the material of the blank, the aforesaid clamping means, press means, relative displacement means and temperature maintaining means cooperatively constituting means for producing free stretching of the material of the blank in a drawing region by forming a transition zone in said material at which flow takes place in the material and the original thickness of the blank is reduced by a factor sufficient to effect orientation and crystallization of the material whereby a drawn element is formed which comprises an edge part composed of said clamped zone and a body which is drawn relative to said edge part and includes the oriented crystallized material, said temperature maintaining means including means in said press means so arraged as to provide for cooling the material of said blank at the temperature below Tg at least in the region of said transition zone to enable the material to be freely stretched thereat without undergoing compressive squeezing between the clamping means and the press means.

4,511,323
ARRANGEMENT FOR STAMPING OUTER SURFACE OF SHAPED BAR MATERIAL

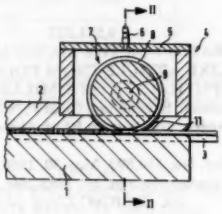
Franz Blaum, Lemberg, Fed. Rep. of Germany, assignor to Gebrüder Kömmerling Kunststoffwerke GmbH, Pirmasens, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,843

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215175

Int. Cl.³ A21C *11/02*

U.S. Cl. 425—385 **11 Claims**



1. An arrangement for stamping an outer surface of a synthetic thermoplastic bar material in thermoplastic condition, comprising

means for guiding a bar material;

a finishing rotary stamping tool having a working surface which is shaped in correspondence with a desired pattern to be stamped and rolls over the bar material to stamp the desired pattern on the latter; and

negative pressure means located at said stamping tool and arranged so that it attracts the bar material against said working surface of said rotary stamping tool simultaneously with rotation of said rotary stamping tool and formation of the pattern on the bar material.

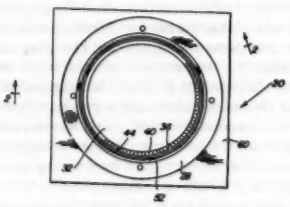
4,511,324
DOUGH FORMING MOLDING ASSEMBLY

Marshall Bauer, Chicago, Ill., assignor to Nation Enterprises, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 481,759, Apr. 4, 1983, and Ser. No. 270,510, Jun. 4, 1981, abandoned. This application Aug. 10, 1984, Ser. No. 639,580

Int. Cl.³ A21C *11/00*; B29C *1/00*

U.S. Cl. 425—398 **9 Claims**



1. A press assembly defining a mold cavity, and for converting a formable mass of raw dough into a thinned sheet having a generally dish-shaped configuration and including a substantially flat bas. sheet unitary with and surmounted and bounded by an integrally formed, circumscribing, upstand peripheral rim-like edge,

said press assembly comprising a piston-like platen having a substantially flat pressure face, said face being cut away at an encircling marginal periphery thereof to define an open-sided trough for receiving dough therewithin during compressive shaping of the raw dough mass,

a sleeve member slidably disposed about said platen and defining a mold cavity therewith,

said platen having a circumscribing bounding face spaced from and in dough-confining relation with a cooperating wall of said member, said member and said platen defining therebetween a clearance spacing in the range of 0.002 to 0.008 inches to permit escape of air from said mold cavity while preventing extrusive loss of dough from said mold cavity during closure of said press assembly,

platen and sleeve member intercoupling means including means for shiftably supporting said member while permitting intrusive penetration coaxially of said platen and withdrawal outwardly of said platen from said member,

means to actuate said assembly for applying molding pressure to dough beneath said platen and within said member, said platen abutting a backing plate and being removably attached to said backing plate, said plate being secured to a shaft connected with said means to actuate said assembly, said platen containing an electric heating element for heating said dough, said backing plate being such as to limit movement of said member relative to said platen such that a mold cavity at all times exists beneath the lower face of said platen.

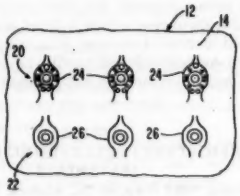
4,511,325
SYSTEM FOR THE REDUCTION OF NO_x EMISSIONS

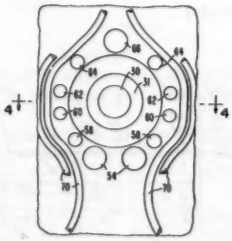
Temple S. Voorheis, Atherton, Calif., assignor to Coen Company, Inc., Burlingame, Calif.

Division of Ser. No. 240,663, Mar. 5, 1982, abandoned. This application Dec. 3, 1982, Ser. No. 446,755

Int. Cl.³ F23N *3/00*

U.S. Cl. 431—10 **7 Claims**





1. A method of controlling NO_x emissions in the products of combustion of a boiler furnace having a pair of vertically spaced rows of burners comprising: firing each lower burner with a relatively large deficiency of air to provide a fuel-rich flame in the lower part of the combustion region of the furnace; firing each upper burner with a relatively small deficiency of air with the flame emanating from each upper burner combining with the flame emanating from a respective lower burner in said region; and directing a volume of air into the region to make up the deficiency of the air through the lower

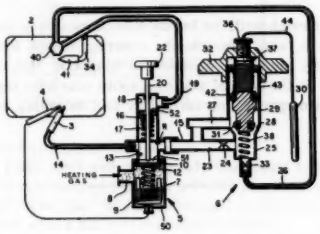
and upper burners, said volume of air being delivered along a number of paths adjacent to and spaced from each upper burner, respectively, certain of said air delivery paths being adjacent to the upper and lower portions of each upper burner, said directing step including moving a greater volume of air along the paths adjacent to the lower portion of each upper burner than is moved along the paths adjacent to the upper portion of the upper burner.

4,511,326

GAS-SUPPLY SYSTEM FOR CATALYTIC GAS BURNERS

Alain Lacroix, Rhone, France, assignor to Societe Lyonnaise des Applications Catalytiques, Rillieux-La-Pape, France

Filed Apr. 26, 1982, Ser. No. 372,053
Claims priority, application France, Apr. 24, 1981, 81 08815
Int. Cl.³ F23Q 9/08
U.S. Cl. 431—53 **11 Claims**



1. A system for supplying a heating gas to a nozzle assembly of a catalytic burner at a higher rate during a start-up phase and at a lower rate during an operating phase,

comprising:

valve means having a housing subdivided into a pluraity of chambers including a first chamber with an inlet connected to a source of heating gas under pressure, a second chamber communicating with said first chamber via a first passage blockable by a first valve member, and a third chamber communicating with said second chamber via a second passage blockable by a second valve member, said first and second valve members being respectively provided with first and second spring means tending to keep said first and second passages closed;

monitoring means in said burner for detecting the absence of a flame in said operating phase;

first conduit means extending to said nozzle assembly from said second chamber;

second conduit means extending to said nozzle assembly from said third chamber;

flow-regulating means in said first conduit means;

a manually operable control element positively linked with said second valve member for moving same against the force of said second spring means to open said second passage upon displacement of said control element from a normal position into an off-normal position, said first valve member being movable against the force of said first spring means into an unblocking position by said control element upon displacement thereof into said off-normal position with resulting gas flow to said nozzle assembly through both said conduit means in said start-up phase; and

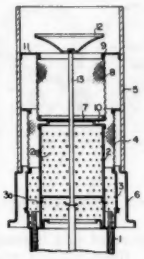
electromagnetic detent means reponsive to said monitoring means for holding said first valve member in said unblocking position in the presence of a flame in said operating phase, thereby maintaining a flow of gas to said nozzle assembly through said first conduit means following cut-off of said second conduit means upon a restoration of said control element to said normal position at the beginning of said operating phase.

4,511,327

OIL BURNER

Toshiro Ogino, Sakurai, and Katsuzo Kokawa, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 17, 1983, Ser. No. 458,446
Claims priority, application Japan, Jan. 19, 1982, 57-7036; Mar. 17, 1982, 57-43470
Int. Cl.³ F23D 5/00
U.S. Cl. 431—201 **2 Claims**



1. An oil burner comprising: an inner flame cylinder having numerous small apertures, an outer flame cylinder having numerous small apertures, said outer flame cylinder being spaced from and surrounding said inner flame cylinder, an outermost cylinder surrounding said outer flame cylinder, a light transmitting outermost cylinder connected to an upper end of said outermost cylinder; a first red-heatable cylinder connected to an upper end of said outer flame cylinder, said first red-heatable cylinder being spaced from and surrounding said inner flame cylinder and having numerous small apertures, a partition plate disposed above said inner flame cylinder and spaced a predetermined distance above a top portion of said inner flame cylinder, a secndary air inlet disposed adjacent to a space between said partition plate and said top portion of said inner flame cylinder, said secondary air inlet for receiving preheated air from a space between said first red-heatable cylinder and said inner flame cylinder, a second red-heatable cylinder disposed above and connected to said partition plate, said partition plate comprising means for preventing non-preheated air from flowing into an interior of said second red-heatable cylinder directly from an interior of said inner flame cylinder, said second red-heatable cylinder having numerous small apertures and an opening in its upper end, and a damper mechanism for varying an opening in an upper end of said second red-heatable cylinder.

4,511,328

APPARATUS FOR THE RECLAMATION OF GLASS FIBER FROM SCRAP FIBER GLASS MAT

Dennis L. Ramge, Perrysburg, Ohio, and John H. Miller, Littleton, Colo., assignors to Manville Service Corporation, Denver, Colo.

Filed Sep. 20, 1983, Ser. No. 534,218
Int. Cl.³ F27B 9/28, 17/00
U.S. Cl. 432—59 **6 Claims**

1. Apparatus for reclaiming inorganic fibers disposed in a continuous strip of non-woven fibers containing a binding agent by removing said agent, said apparatus comprising:

a heating zone;

means for moving said strip through said heating zone;

means for supporting said strip along a predetermined path as said strip is being moved through said heating zone, said strip being fully supported in said zone both before and after said binding agent is removed;

means for generating a heating fluid;

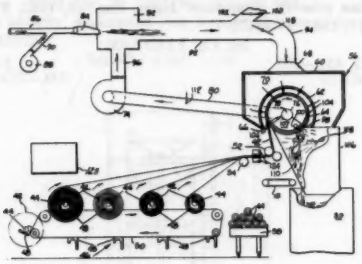
means for conducting said heating fluid to said heating zone;

means for drawing said heating fluid through said strip to

decompose said binding agent and remove said binding agent from the strip; and

means for controlling

(a) the rate of movement of said strip through said heating zone,



(b) the mass flow rate of said heating fluid through the strip, and

(c) the temperature of said heating fluid, to ensure that said inorganic fibers are not exposed to temperatures sufficient to cause said fibers to fuse; whereby reclaimed inorganic fibers are obtained.

4,511,329

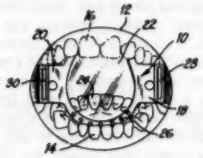
MOISTURE CONTROLLING LINGUAL DENTAL MIRROR

Michael K. Diamond, 86 Milburn La., Roslyn, N.Y. 11577

Filed Jan. 26, 1984, Ser. No. 574,259

Int. Cl.³ A61C 1/00, 3/00

U.S. Cl. 433—31 **24 Claims**



1. A dental instrument for viewing the lingual surface of the lower dentition comprising:

a rigid planar base member for positioning in a substantially vertical orientation from top to bottom of the mouth so as to vertically span the mouth cavity rearwardly of the upper and lower dentition and supporting a planar reflective means on a forward surface thereof, for reflecting the lingual view of the lower dentition while precluding the tongue from entering the dental work area, and

a pair of wall members laterally extending on either side of said base member for maintaining the upper and lower dentition in spaced relationship and for providing rest blocks for the dentition.

4,511,330

INTEGRATED ORAL MAGNETIC OSTEOGENIC APPLIANCES

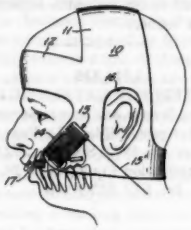
Harry Smiley, White Plains, and Abraham Blechman, Tappan, both of N.Y., assignors to Medical Magnetics, Inc., Ramsey, N.J.

Continuation-in-part of Ser. No. 322,423, Nov. 18, 1981, Pat. No. 4,424,030, which is a continuation of Ser. No. 19,427, Mar. 12, 1979, abandoned. This application Oct. 3, 1983, Ser. No. 538,380

Int. Cl.³ A61C 7/00

U.S. Cl. 433—18 **20 Claims**

1. In combination for use in orthodontic and/or periodontal therapy, an extra-oral positioning fixture comprising headgear means having top, front and rear strap-like portions adapted to conform to and be retained by the head of a patient, said headgear means including a mounting portion configurated to retain its position adjacent a region of one cheek and in substantial overlap with the buccal side of maxillary and/or mandible teeth; and magnetically coacting means including an intra-orally mounted element of magnetic flux-conducting material on the lingual side of a tooth near said region and a source of magnetic flux carried by said mounting means.



4,511,331

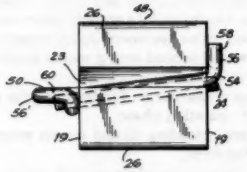
CONVERTIBLE BUCCAL TUBE/BRACKET APPLIANCE

Robert A. Scebold, Westlake Village, and James D. Cleary, Monrovia, both of Calif., assignors to Unitek Corporation, Monrovia, Calif.

Filed Aug. 8, 1983, Ser. No. 520,957

Int. Cl.³ A61C 7/00

U.S. Cl. 433—17 **2 Claims**



1. An orthodontic appliance convertible from a buccal tube to a bracket comprising:

a bracket body portion having opposing vertical surfaces and including a buccal surface having a longitudinal slot extending substantially mesial-distal therethrough; and

a removable wire insert attached to said body portion having an intermediate portion and two end portions, each extending from an opposing end of said intermediate portion, said intermediate portion extending longitudinally through the length of said slot and being positioned within at least a portion of said slot so as to form a tubular passageway between said body portion and said insert for accommodating an arch wire therethrough, said two opposing end portions protruding from said slot so as to be externally accessible for facilitating removal of said insert, uncovering of said slot and permitting said body portion to be used as a bracket; wherein at least one end portion is formed into a helical loop, said loop having a terminal portion attached to a vertical surface.

4,511,332
DENTAL ARTICULATOR

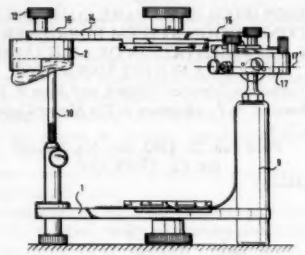
Heinz Mack, Südl. Auffahrtsallee 64, 8000 München 19, Fed. Rep. of Germany

Continuation of Ser. No. 293,241, Aug. 17, 1981, abandoned. This application Aug. 9, 1983, Ser. No. 521,225

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033390

Int. Cl.[3] **A61C** *11/00*

U.S. Cl. 433—59 **3 Claims**



1. A dental articulator comprising:

a lower frame part with a generally horizontal holding device for a mounting plate for a lower jaw model;

a vertical frame part which is fastened to the lower frame part and which has two articulation heads;

an upper frame part with a generally horizontal holding device for a mounting plate for an upper jaw model and also with two radially rotatable articulation sockets which engage a respective said articulation head and which together form a horizontal pivot axis for said upper frame part, said horizontal pivot axis corresponding to the jaw joint and defining a horizontal reference plane parallel to both said holding devices;

a vertically adjustable front tooth guide pin disposed on the lower frame part;

a support table disposed on the upper frame part and divided into two regions, one region being a planar portion which provides a central support region for the point of impact of the front tooth guide pin before commencement of the excursions of the guide pin and which remains invariably in the horizontal position in the reference plane before commencement of the excursions, the other region being pivotable forwards and downwards at the front relative to the one region such that the points of impact of the excursions of the guide pin take place on the other region.

4,511,333
DEVICE FOR BURNING CEMENT

Oswald Kunze, Rösrath, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Dec. 16, 1982, Ser. No. 450,347

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150501

Int. Cl.[3] **F27B** *7/02*; **C04B** *7/02*

U.S. Cl. 432—106 **3 Claims**

1. In a cement making mechanism, the combination comprising:

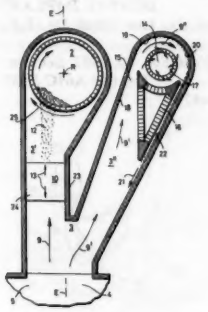
a rotary tubular kiln,

means for introducing precalcined raw meal to said kiln,

a cooler disposed vertically below the discharge end of said kiln to catch calcined material falling from said kiln,

a vertical conduit connecting the discharge end of said kiln with the inlet end of said cooler, said conduit providing free fluid communication between said cooler and said discharge end of said kiln whereby air from said cooler passes through said conduit and into said discharge end, said conduit above said cooler being divided into two branches including a first branch leading to said discharge end of said kiln, said first branch including wall means narrowing said first branch above said cooler and providing a flow constriction for air passing from said cooler to said discharge end of said kiln,

an adjustable flow restricting means positioned in said first branch for adjustably throttling flow of air between said kiln and said cooler, while permitting the free fall of solid calcined material from said kiln to said cooler,



a tertiary air conduit located in the second branch of said conduit, and

a flow guide element positioned below said tertiary conduit in said second branch and being configured to force the flow of air rising from said cooler into a turbulent flow about said tertiary air conduit resulting in a centrifugal action on particles suspended in the air stream to deposit said particles in said second branch beyond said tertiary air conduit.

4,511,334
DENTAL INSTRUMENT FOR CUTTING SLOTS FOR RECEIVING IMPLANTS INTO THE JAW

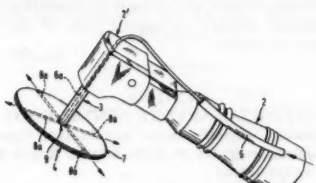
Hans L. Grafelmann, Parkstrasse 105, 2800 Bremen, Fed. Rep. of Germany

Filed Aug. 15, 1983, Ser. No. 523,378

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 8233133[U]

Int. Cl.[3] **A61C** *3/02*

U.S. Cl. 433—165 **12 Claims**



1. In a dental rotary instrument, which is adapted to be driven by a dental handpiece and to cut a slot for receiving an implant into a jaw,

the improvement which comprises

a rotary sawblade, which has a circular periphery and is provided at said periphery with sawteeth and is formed with a plurality of angularly spaced apart, radial passages, which open at said periphery,

driving means, connected to a dental handpiece to transmit torque from said handpiece to said sawblade for rotating the latter, and

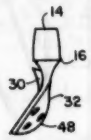
coolant supply and guiding means disposed within said sawblade and connected to said dental handpiece to supply and guide a coolant from said handpiece to each of said radial passages at a point which is radially inwardly spaced from said periphery, said sawteeth being set at said periphery so as to retain the coolant flow at the cutting region of said sawblade.

4,511,335

DENTAL IMPLANT

O. Hilt Tatum, Jr., One Beach Dr., S.E., St. Petersburg, Fla. 33701

Filed Sep. 30, 1982, Ser. No. 428,920
Int. Cl.³ A61C 8/00
U.S. Cl. 433—173 **12 Claims**



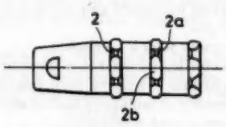
1. An endosseous implant for permanent implantation within a groove formed in the posterior alveolar process of of the mandible of a patient's mouth, comprising in combination:
- a supporting head for supporting a crown portion of an artificial tooth, said supporting head having a base portion;
- a constricted neck portion disposed adjacent to said base portion for supporting said supported head;
- an apertured blade portion disposed adjacent to said neck portion such that said neck portion connects together said supporting head relative to said blade portion;
- said blade portion including a lingual face and buccal face;
- said blade portion including a mesial portion and an adjoining distal portion;
- said neck portion being disposed adjacent the juncture of said mesial portion with said distal portion;
- said mesial portion including a substantially blunt mesial edge;
- said distal portion including a distal edge of pointed configuration; and
- said distal portion defining a curvature which curves in a lateral medial plane, said distal portion additionally being twisted about the longitudinal axis of said mesial portion for yielding a three dimensional configuration such that the implant follows the natural flow of the mandible towards the Ramus.

4,511,336

ARTIFICIAL APATITE DENTAL ROOT

Tsuneo Hidaka; Masahide Inoue, and Makoto Ogiso, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1982, Ser. No. 450,158
Claims priority, application Japan, Dec. 17, 1981, 56-204133
Int. Cl.³ A61C 8/00
U.S. Cl. 433—173 **2 Claims**



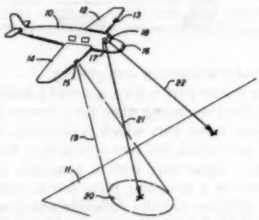
1. A dental prothetic device comprising an implant member having a cylindrical end portion adapted to be inserted into a cavity in a jaw bone and a truncated conical end portion adapted to have an artificial tooth secured thereon, said cylindrical portion having a plurality of raised annular rings thereon spaced along the length thereof with each ring having a plurality of circumferentially spaced apart projections and intermediate flat portions connecting said projections whereby said flat portions will be spaced from surrounding tissue by a predetermined clearance due to the engagement of said projections with surrounding tissues.

4,511,337

SIMPLIFIED HARDWARE COMPONENT INTER-CONNECTION SYSTEM FOR GENERATING A VISUAL REPRESENTATION OF AN ILLUMINATED AREA IN A FLIGHT SIMULATOR

Alfred R. Fortunato; Maurice Millard, and John R. Trzeciak, all of Binghamton, N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Jun. 25, 1982, Ser. No. 392,205
Int. Cl.³ G09B 9/08
U.S. Cl. 434—43 **1 Claim**



1. Apparatus for generating, on the display surface of a raster scan device, an illuminated area having a predetermined geometrical configuration simulating the base of a cone of light that would be visible on a more distant plane surface, where the orientation of said cone of light can be varied, and said geometrical configuration is adjustable in size and shape to simulate changes in position of said base on said plane surface as the orientation of said cone of light is varied, comprising:
- computer I/O means to compute and to provide signals representative of the display axis to ground axis direction cosine matrix elements, b_{31}, b_{32}, and b_{33}, and various values of a light shape coefficient, G_1 through G_8;
- horizontal sweep generator means to generate a signal Tan Ψ and a vertical sweep generator means to generate a signal Tan θ to represent instantaneous azimuth and elevation values, respectively, of the base of a cone of light as the base appears on a display device;
- a first multiplier circuit means to receive the output from said horizontal sweep generator means and to receive said signal from said computer I/O means that is representative of said element b_{32} to provide a signal output representative of the function b_{32} Tan Ψ;
- a second multiplier circuit means to receive the output from said vertical sweep generator means and to receive said signal from said computer I/O means that is representative of said element b_{33} to provide a signal output representative of the function b_{33} Tan θ;
- first ADD circuit means to sum the functions b_{32} Tan $\Psi$and b_{33} Tan θ with said signal b_{31} from said computer I/O means, to provide an output signal representative of a value C_3 which is the related vertical component of the display surface;
- a third multiplier circuit means to receive a light shape coefficient value signal G_3 output from said I/O means and to receive said Tan Ψ signal to generate a function G_3 Tan Ψ;
- a fourth multiplier circuit means to receive a light shape coefficient value signal G_2 output from said computer I/O

means and to receive said Tan θ signal to generate a function G_2 Tan θ;

second ADD circuit means to sum the functions G_3 Tan Ψ and G_2 Tan θ with a light shape coefficient value signal G_1 output from said computer I/O means to provide an output signal representative of a value F_2;

a fifth multiplier circuit means to receive a light shape coefficient value signal G_5 output from said computer I/O means and to receive said Tan Ψ signal to generate a function G_5 Tan Ψ;

a sixth multiplier circuit means to receive a light shape coefficient value signal G_6 output from said computer I/O means and to receive said Tan θ signal to generate a function G_6 Tan θ;

third ADD circuit means to sum the functions G_5 Tan Ψ and G_6 Tan θ with a light shape coefficient value signal G_4 output from said computer I/O means to provide an output signal representative of a value F_3;

first circuit means to provide signalvalues equal, respectively, to $\text{Tan}^2\Psi$ and $\text{Tan}^2\theta$;

a constant voltage source to provide a voltage output at a predetermined value;

inverter amplifier ADD circuit means to receive said $\text{Tan}^2\Psi$ and $\text{Tan}^2\theta$ signal values and to sum said values with said voltage output of the constant voltage source to provide an output signal representative of a value F_1;

a seventh multiplier circuit means to receive said value F_1 and to receive a light shape coefficient value signal G_8 from said computer I/O means to provide an output signal representative of a value G_8F_1;

second circuit means to receive said value C_3 and to provide a signal value output equal to C_3^2;

eighth multiplier circuit means to receive said C_3^2 signal and a light shape coefficient value signal G_7 from said computer I/O means to provide an output signal representative of a value $G_7C_3^2$;

third circuit means to receive said value F_2 and to provide a signal value output equal to F_2^2;

ninth multiplier circuit means to receive also said value C_3 and said value F_3 to provide an output signal representative of a value Γ_3C_3;

fourth ADD circuit means to sum the four functions $G_7C_3^2$, F_3C_3, G_8F_1 and an inverted F_2^2 to provide an output signal representative of a value T;

a signal comparator circuit means to receive said value T to determine whether each point on said geometrical configuration would be visible; and

a video processor responsive to said signal comparator circuit means for modulation of said raster scan device;

whereby the video modulation creates said illuminated area directly on said display surface corresponding to each point on said geometrical configuration that would be visible.

4,511,338

WATER BICYCLE AND DETACHABLE DEVICE THEREFOR

Noël Fanelli, 15 Rue Berthollet, Mions (Rhone), France

Filed Mar. 4, 1983, Ser. No. 472,351
Int. Cl.³ B63H *16/12*
U.S. Cl. 440—26 **12 Claims**

1. A detachable bicycle device for converting a sail board member into a water bicycle to propel said sail board member along a body of water, said device comprising:

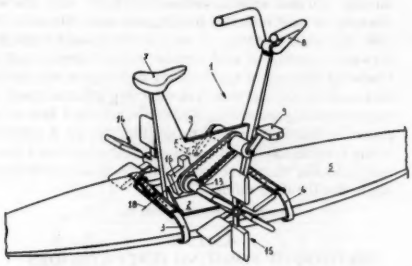
a longitudinal frame member detachably mounted to said sail board member;

a steering handle rotatably mounted to said longitudinal frame member;

a drive shaft transversely mounted to said longitudinal frame member, said drive shaft having one end extending beyond one side of said sail board member, an opposite end extending beyond another side of said sail board member and an intermediate portion rotatably mounted to said longitudinal frame member, said drive shaft further defining a drive axis transverse to said longitudinal frame member;

a pair of paddle wheels, one of said pair of paddle wheels being mounted to said one end of said drive shaft and extending beyond said sail board member, the other of said pair of paddle wheels being mounted to said opposite end of said drive shaft and extending beyond said sail board member, said pair of paddle wheels further extending beyond a bottom surface of said sail board member such as to engage said body of water below said sail board member;

means for driving said drive shaft, said driving means being mounted to said longitudinal frame member to selectively



rotate said drive shaft to propel said water bicycle along said body of water; and

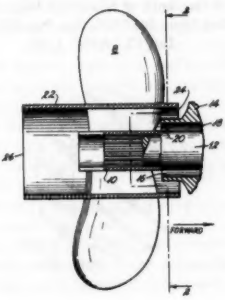
means for steering said bicycle in said body of water, said means for steering mounted to said drive shaft for cooperation therewith, said means for steering having a steering axis substantially perpendicular to said drive axis and means for pivoting said drive shaft about said steering axis such that as said drive shaft is pivoted about said steering axis one of said pair of paddle wheels is rotated upward in a direction away from the water such as to engage less of said body of water while the other of said pair of paddle wheels is rotated downwards such as to engage more of said body of water to thereby selectively steer said water bicycle in said body of water.

4,511,339

THROUGH-HUB EXHAUST PROPELLER ASSEMBLY

Kenneth Kasschau, 17620 Garrett Dr., Gaithersburg, Md. 20878

Continuation-in-part of Ser. No. 971,551, Dec. 20, 1978, Pat. No. 4,388,070. This application Jun. 14, 1983, Ser. No. 504,127
Int. Cl.³ B63H *5/12*
U.S. Cl. 440—89 **6 Claims**



1. A propeller for a through-hub exhaust marine propulsion device, comprising:

a housing surrounding a propeller shaft, said housing having a rearward opening with a diameter, said rearward opening of said housing and said propeller shaft defining a rearwardly disposed exhaust port;

a sleeve driveably attached to said propeller shaft, said sleeve having a diameter substantially less than the diameter of said rearward opening;

at least one propeller blade having an inner end and an outer end extending from and attached to said sleeve; and

a single annular shroud means concentric with said sleeve and said propeller shaft and attached to said propeller blade intermediate said inner and outer ends of said blade, said annular shroud means having a forward opening and a rearward opening, said forward opening of said single annular shroud means, concentric with said rearward opening of said housing, having a greater diameter than said rearward opening of said housing, said concentric forward opening of said annular shroud means and said rearward opening of said housing defining an annular gap, said annular shroud means conducting exhaust gases and engine cooling water forward of the forward face of said propeller blade when said propulsion device is operating in the reverse mode and rearward of the rearward face of said propeller blade when said propulsion device is operating in the forward mode.

4,511,340

METHOD OF FORMING HOT CATHODES

Eberhard Weiss, Stuttgart, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,567

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151347

Int. Cl.[3] **H01J** *9/04*

U.S. Cl. 445—6 **2 Claims**

1. A method of forming cathodes for use in a cathode ray tube comprising the steps of:

supplying current to the heater tube element to rapidly heat the cathode sleeve to about 1200° C.,

switching the heater current on and off repeatedly to provide a temperature differential between the cathode and the emitting material deposited thereon,

applying rated voltages to the electrodes in the cathode ray tube,

cycling the heater current between on and off such that the current average maintains the rated heating power and power dissipation with the off periods regulated such that when the temperature of the emitting material decreases, no saturation of the electrode current occurs.

4,511,341

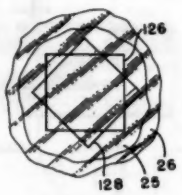
ANIMATED COIN SORTING BANK

John W. Spirk, Jr., 50 Stonewood Dr., and John R. Nottingham, 60 Stonewood Dr., both of Moreland Hills, Ohio 44022

Filed Mar. 26, 1984, Ser. No. 593,475

Int. Cl.[3] **A45C** *1/12*

U.S. Cl. 446—9 **26 Claims**



1. An animated sorting bank comprising a housing having an inlet for receiving a coin in an upright orientation, a display member supported for rotation about a central axis and a sorting area comprising a plurality of coin bins and a sorting ramp, said display member being rotatable relative to a display wall of said housing to cause animation of a composite image formed partly on said display member and partly on said display wall of said housing, each of said coin bins being dimensioned to receive a different diameter coin, said sorting ramp being designed to receive coins of different diameters and to sort the coins in respective coin bins according to their diameters, said housing and said display member cooperating to receive a coin from said inlet in an upright condition and to guide said coin by gravitational/inertial forces between said inlet and said sorting area while maintaining the coin in the upright orientation, the path of travel of the coin between the inlet and the sorting area including an arcuate segment that at least partly circumscribes the central axis of the display member, the housing and the display member being further configured such that an initial phase of the movement of a coin along its arcuate segment is substantially horizontal and a succeeding phase of movement of the coin along its arcuate segment is substantially vertical, the display member including a plurality of actuating surfaces circumferentially spaced such that at any rotated angle of said display member at least one of said actuating surfaces will be positioned for engagement by a coin during its initial phase of movement and prior to its succeeding phase of movement along the arcuate segment of its path of travel, the actuating surfaces being further disposed so that when a coin moves along the arcuate segment of its path of travel and engages an actuating surface a force-couple is applied to the display member to rotate the display member about its central axis first slowly during its initial phase of movement and then significantly faster as the coin moves through the succeeding phase of movement along the arcuate segment, the housing and the display member being still further configured so that a coin is released from engagement from an actuating surface on the display member after imparting rotation to the display member, and the housing allowing a coin that is released from an actuating surface on the display member to move toward said sorting ramp under gravitational/inertial forces.

4,511,342

WINDING AND LAUNCHING DEVICE FOR TOY VEHICLES

William Hart, Palos Verdes Estates, and Michael T. McKittrick, Jr., Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Aug. 19, 1983, Ser. No. 524,513

Int. Cl.[3] **A63H** *29/00*

U.S. Cl. 446—429 **1 Claim**

1. A device for winding and launching a vehicle of the type which has a rotatable input coupling, comprising:

a base member;

at least two upstanding partitions on said base member for providing at least one stall for garaging said vehicle;

a shell affixed to said base member, said shell having an elevated roof portion covering said stall, and a roadway portion leading from ground level to said roof portion;

a U-shaped yoke having a bit portion and an arm extending from each end of said bite portion substantially normal thereto;

means for connecting said yoke to the upper surface of said roof portion in a manner such that said yoke will pivot about the major axis of said bite portion;

a platform member swingably connected to the free ends of said arms;

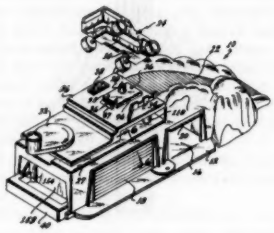
a spring biasing said platform to an elevated position;

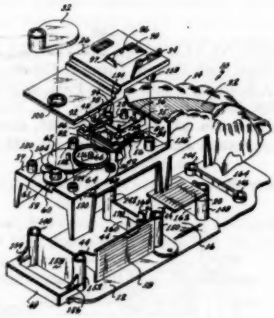
a button connected to said yoke for lowering said platform by swinging said yoke downwardly about said bite portion;

a coupling mechanism rotatably mounted to said platform for imparting rotation to said input coupling on said vehicle;

an elongated pinion gear affixed to said coupling mechanism;

a spindle affixed to said roof for rotatably and reciprocally receiving said elongated pinion;
a first large-diameter gear drivingly engaging said elongated pinion;
a first small-diameter gear affixed to said first large-diameter gear;
a second large-diameter gear drivingly engaging said first small diameter gear;
a second small-diameter gear carried by said second large-diameter gear;
a third large-diameter gear drivingly engaging said second small-diameter gear;





an idler gear mounted to said roof portion in an arcuate slot;
a crank gear drivingly engaging said idler gear;
a crank affixed to said crank gear, said idler gear being adapted to move in said slot and engage said third large-diameter gear when said crank is rotated in a first direction and to move out of engagement with said third large-diameter gear when said crank is rotated in a direction opposite to said first direction;
a stand for covering said gears and said yoke, said stand including a first opening for said platform and a second opening for said button; and
means for affixing said stand to said roof portion.

4,511,343

WHEELED MINIATURE TOY VEHICLE WITH EASILY SELECTABLE PLURAL MODES OF USE

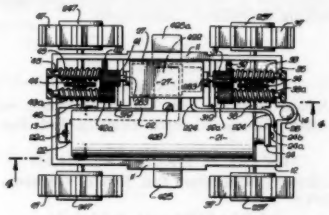
Adolph E. Goldfarb, Tarzana, Calif.; Delmar K. Everitt, 4310 Tosca Rd., Woodland Hills, Calif. 91364, and Norman J. Burger, 10164 Lev Ave., Pacoima, Calif. 91331, assignors to Delmar K. Everitt, Woodland Hills and Norman J. Burger, Pacoima, both of, Calif.

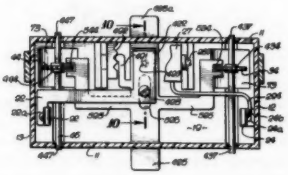
Continuation-in-part of Ser. No. 417,554, Sep. 13, 1982, , which is a continuation-in-part of Ser. No. 233,495, Feb. 11, 1981, abandoned, which is a continuation-in-part of Ser. No. 121,645, Feb. 14, 1980, Pat. No. 4,306,375. This application Nov. 2, 1982, Ser. No. 438,510

The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.

Int. Cl.³ A63H *29/24*

U.S. Cl. 446—463 **18 Claims**





1. A plural-speed miniature wheeled toy vehicle for use with electrical battery means that comprise an elongated dry-cell battery having a longitudinal axis, and for both generally conventional-toy operation at at least one speed on a generally flat surface and climbing-toy operation at at least one reduced speed with greater torque on a steep and/or irregular surface; said vehicle having, when such battery means are in use therewith, major weight components positioned to provide a generally symmetrical, compact, balanced and relatively low arrangement; said vehicle comprising:
a chassis having walls defining an interior compartment;
front wheel means and rear wheel means mounted to the chassis for rolling rotation about respective mutually parallel but spaced-apart front and rear axes;
means mounted in the interior compartment to releasably support such electrical battery means in the compartment with such longitudinal axis of such battery means extending substantially front-to-back of the vehicle and extending at least substantially the full distance between the front and rear axes;
an electric motor mounted in the interior compartment, and having a driveshaft;
means on the chassis for electrically connecting such battery means, when supported in the supporting means, to the motor, so that such battery means power the motor driveshaft;
a speed-reduction mechanism mounted in the interior compartment and connecting the motor driveshaft to both said front and said rear wheel means to transmit rotation from

the driveshaft to the wheel means with a mechanical advantage; and

means associated with the speed-reduction mechanism for selecting among a plurality of values of the mechanical advantage, including at least one value providing such generally conventional-toy operation for generally flat surfaces and at least one other value providing such climbing-toy operation with greater torque for steep and/or irregular surfaces;

at least major portions of the motor and of such battery means, when such battery means are supported in the supporting means, being at approximately the same height as the front and rear wheel means, to particularly enhance such climbing-toy operation at said other value on such steep and/or irregular surfaces; and

the motor, the speed-reduction mechanism, the selecting means, and such battery means, when such battery means are supported in the supporting means, substantially fully occupying the interior compartment.

4,511,344
CARDAN JOINT

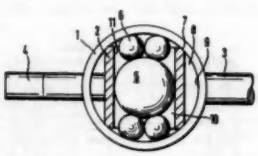
Werner Krude, Siegburg, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Oct. 21, 1983, Ser. No. 544,461

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239136

Int. Cl.³ F16D *3/33, 3/34, 3/36*

U.S. Cl. 464—139 **7 Claims**



1. A universal joint for transmitting torque and having a large angle of articulation comprising an inner joint member and an outer joint member coupled together to transmit torque therebetween, said joint members being both configured as hollow cylinders with said inner joint member being smaller than said outer joint member, and with said smaller inner joint member being arranged inside of said larger outer joint member and centering means held in engagement between said joint members for maintaining said joint members centered relative to each other, said centering means comprising centering ball means located generally centrally of said joint and supporting ball means located adjacent said centering ball means on opposite sides thereof.

4,511,345
CONSTANT SPEED JOINT ASSEMBLY

Otmar Winkler, Schweinfurt, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

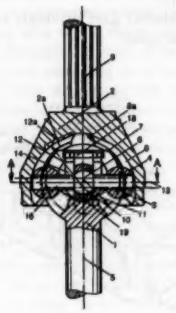
Filed Nov. 23, 1982, Ser. No. 443,869

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1981, 3148489

Int. Cl.³ F16D *3/30*

U.S. Cl. 464—145 **10 Claims**

1. Constant speed joint assembly comprising an outer joint body member having an axis of rotation and being of cup-like form defining an open chamber and an inner joint body member having an axis of rotation which nests in the chamber of the outer joint body member and at least two rolling elements arranged therebetween capable of transmitting a torque which engage in an inner arcuate groove in the inner joint body member curved in a longitudinal direction about a first center of curvature lying on the axis of rotation of the inner joint body member and in an outer groove in the outer joint body member lying radially opposite the inner joint body member and curved in a longitudinal direction about a second center of curvature offset in a longitudinal direction on the axis of rotation of the outer joint body member in relation to the radius of curvature of the mating inner groove and control means maintaining the rolling elements in a plane bisecting the angle between the axes of rotation of said joint body member during angular movement of the axes of rotation of the two joint body members, said inner joint body member having a centric cavity, said first and second centers of curvature being offset an equal distance on opposite side of said bisecting plane, said control means comprising a control body mounted in said cavity having at least two control arms rigidly connected to said control body, said control arms engaging through said inner groove and adapted to maintain and coact with the rolling elements to maintain the same in said bisecting plane.



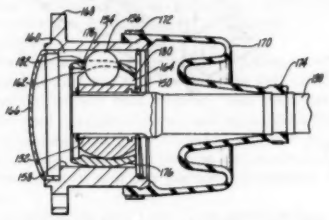
4,511,346
CONSTANT VELOCITY UNIVERSAL JOINT

Daniel W. Hazebrook, Detroit; Glenn F. Gehrke, Brighton, and Michael J. Schmidt, Grosse Pointe Park, all of Mich., assignors to GKN Automotive Components, Inc., Southfield, Mich.

Division of Ser. No. 183,757, Sep. 3, 1980, abandoned. This application Jan. 5, 1983, Ser. No. 455,783

Int. Cl.³ F16D *3/02*

U.S. Cl. 464—146 **2 Claims**



1. A constant velocity universal joint comprising:

an outer joint member having a cylindrical portion, said cylindrical portion having an axis and a plurality of longitudinal grooves along an inner cylindrical surface;

an inner joint member coaxially mounted with said outer joint member for cooperation therewith, said inner joint member having an axis common with said axis of said outer joint member and a plurality of longitudinal grooves substantially parallel to said plurality of longitudinal grooves in said outer joint member;

a plurality of spherical members mounted in said plurality of

longitudinal grooves of said inner and outer joint members for transmitting torque between said inner and outer joint members;

an annular restraining member centrally disposed between said inner and outer joint members, said annular restraining member further comprising:

a part-spherical outer surface cooperating with the inner cylindrical surface of said outer joint member; and

an inner contoured surface disposed adjacent said part-spherical outer surface, said inner contoured surface and said part-spherical outer surface having portions defining a plurality of apertures interposed said part-spherical outer surface and said inner contoured surface, said plurality of apertures locating said plurality of spherical members in a plane normal to the axis of said annular restraining member, the intersection of said normal plane and said common axis of said inner and outer joint members defining a joint center;

means for providing a limited relative axial movement of said outer joint member relative to said inner joint member as said plurality of spherical members move in said plurality of longitudinal grooves of said inner and outer joint members;

said inner joint member further having an outer contoured surface juxtaposed said inner contoured surface of said annular restraining member;

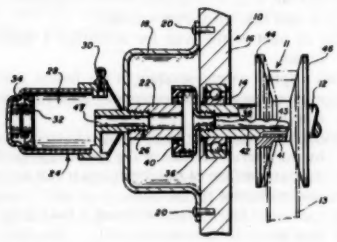
means defining a first spherical surface on said outer contoured surface of said inner joint member, said first spherical surface defining means having a first radius, said first radius having its center along said common axis and centrally located with said outer contoured surface of said inner joint member; and

said inner contoured surface of said annular restraining member having a second radius greater than said first radius, said second radius having its center centrally disposed with said inner contoured surface of said annular restraining member and displaced below said common axis to provide a predetermined clearance between said inner joint member and said inner contoured surface of said annular restraining member whereby when said inner joint member moves axially relative to said outer joint member said inner joint member moves a predetermined axial distance relative to said annular restraining member prior to said annular restraining member moving axially relative to said outer joint member.

4,511,347
LUBRICATION IMPROVEMENT FOR VARIABLE SPEED DRIVES

Benson R. Moore, Milwaukee, and Leonard T. Gnacinski, West Allis, both of Wis., assignors to MagneTek, Inc., Milwaukee, Wis.

Filed Oct. 20, 1983, Ser. No. 543,736
Int. Cl.³ F16H 55/56
U.S. Cl. 474—43 **4 Claims**



1. In a variable speed drive of the type having shaft-mounted variable pitch pulleys interconnected by a drive belt contained within an enclosure, the improvement of a lubrication system for lubricating the variable pulley mechanism in combination therewith comprising:

(a) a pressurized grease feeder secured to the enclosure of said drive,

(b) a seal mounted between said grease feeder and a pulley shaft to prevent escape of lubricating grease and to permit rotation of said pulley shaft,

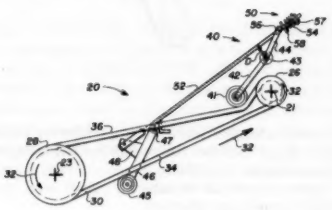
(c) a sheave half having a spline interconnection to said pulley shaft, and

(d) a hollow passageway in said pulley shaft communicating pressurized grease from said feeder to said spline interconnection.

4,511,348
DRIVE TENSIONING APPARATUS

Daniel C. Witdoek, Hooglede, and André G. J. Dhont, Maldegem, both of Belgium, assignors to Sperry Corporation, New Holland, Pa.

Filed Jun. 24, 1982, Ser. No. 391,773
Int. Cl.³ F16H 7/12
U.S. Cl. 474—109 **19 Claims**



1. In a crop harvesting machine having a frame; a crop harvesting mechanism mounted on said frame and being operably driven by a rotational power input mechanism, said crop harvesting mechanism having a power input shaft for receiving rotational power delivered thereto; power means mounted on said frame to provide rotational power for driving said crop harvesting mechanism, said power means having a power output shaft for delivering rotational power from said power means; power transfer means for transferring rotational power from said power output shaft to said power input shaft, said power means having a first power transfer member affixed to said power output shaft, a second power transfer member affixed to said power input shaft and an endless flexible member entrained between said first and second power transfer members to transfer rotational power therebetween, said flexible member having a normally slack run and a normally taut run; and tensioning apparatus operably engaged with said flexible member to maintain proper tension therein, an improved tensioning apparatus comprising,

a first tensioning member pivotally mounted on said frame by a first pivot and engageable with said flexible member on said normally slack run;

a second tensioning member pivotally mounted on said frame by a second pivot and engageable with said flexible member on said normally taut run;

connecting means interconnecting said first and second tensioning members such that pivotal movement of said tensioning members effects an inversely proportional change in the respective distance between said connecting means and said first and second pivots; and

biasing means associated with said connecting means to create a substantially constant force on said connecting means and effect a tensioning force exerted by said first and second tensioning members on said flexible member, said tensioning force being variable and a function of the distance between said connecting means and the respective said pivot, the tensioning force exerted by said first

and second tensioning members being inversely proportional.

4,511,349

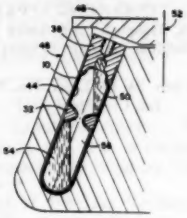
ULTRACENTRIFUGE TUBE WITH MULTIPLE CHAMBERS

Steven T. Nielsen, Sunnyvale, and Carleton C. Lee, San Jose, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 395,371, Jul. 6, 1982, abandoned. This application Feb. 27, 1984, Ser. No. 583,271

Int. Cl.³ B04B 5/02

U.S. Cl. 494—16 **9 Claims**



1. A multi-chamber ultracentrifuge tube for placement in an ultracentrifuge inclined rotor and for centrifuging a fluidic sample, said tube comprising:

an upper cylindrical chamber;

a lower cylindrical chamber;

a constricted area joining said chambers and forming a channel between said chambers, said channel having a sectional perimeter smaller than the sectional perimeter of each of said chambers; and

a spacer mounted adjacent said constricted area to support said chambers during centrifugation said spacer having a density of the order of magnitude of the density of said fluidic sample, whereby stresses on said lower chamber during ultracentrifugation are substantially avoided.

4,511,350

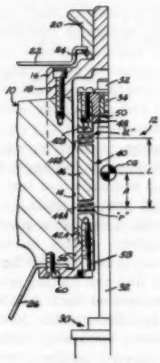
SUSPENSION SYSTEM FOR A CENTRIFUGE ROTOR

William A. Romanauskas, Southbury, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 6, 1983, Ser. No. 539,364

Int. Cl.³ B04B 9/14

U.S. Cl. 494—82 **1 Claim**



1. In a centrifuge having a rotor with a weight W and a drive member connectable to the rotor the improvement comprising a suspension system for mounting the rotor to the drive member, the suspension system comprising a coupling having a first and a second collar each connected by a flexible link to a rigid shaft, one collar being connected at a connection point "r" to the rotor such that the rotor's center of gravity lies a predetermined distance A above the connection point "r" and the second collar being connected at a second connection point "d" to the shaft, the rigid shaft having a length L, the flexible link adjacent the connection point "r" having a torsional stiffness K_r associated therewith while the flexible link adjacent the connection point "d" having a torsional stiffness K_d associated therewith, the distance A being defined by the relationship:

$$A = \frac{L \cdot K_r}{K_r + K_d + L \cdot W}$$

4,511,351

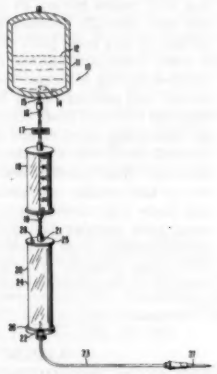
PARENTERAL DELIVERY SYSTEM UTILIZING A HOLLOW FIBER CELLULAR UNIT

Felix Theeuwes, Los Altos, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Filed May 14, 1984, Ser. No. 609,592

Int. Cl.³ A61M 5/14

U.S. Cl. 604—56 **5 Claims**



1. A method for administrating a beneficial drug to a warm-blooded animal, which method comprises the steps of:

(a) introducing into the animal a delivery member in fluid communication with an intravenous delivery system, which system comprises:

(1) a reservoir of a pharmaceutically acceptable fluid;

(2) a formulation cell in fluid communication with the reservoir, which formulation cell comprises:

(i) a wall that surrounds a lumen;

(ii) an inlet in the wall for admitting a fluid into the lumen;

(iii) a spiral wound module in the lumen, said module comprising a permselective membrane wound around a hollow fiber;

(iv) a beneficial drug in the lumen in the space formed by the interior surface of the formulation cell and the exterior surface of the formulation cell and the exterior surface of the module;

(v) an outlet in the wall for letting a fluid drug formulation leave the formulation cell,

(b) admitting fluid into the formulation cell for contacting the drug in the space that passes into the spiral wound module for entering the hollow fiber to flow from the formulation cell; and,

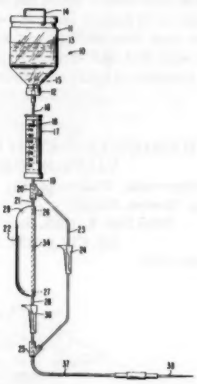
(c) administering the fluid drug formulation flowing from the formulation cell to the animal.

4,511,352

PARENTERAL DELIVERY SYSTEM WITH IN-LINE CONTAINER

Felix Theeuwes, Los Altos, and John Urquhart, Palo Alto, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed May 14, 1984, Ser. No. 609,894
Int. Cl.³ A11M *5/14*
U.S. Cl. 604—56 **12 Claims**



1. A method for the administration of a beneficial drug to an animal, which method comprises:

(a) admitting into the animal a delivery member in fluid communication with an intravenous delivery system, the system comprising:

(1) a reservoir of a pharmaceutically acceptable fluid;

(2) a drip chamber in fluid communication with the reservoir;

(3) a container in fluid communication with the drip chamber and with the delivery member, the container comprising:

(i) a wall that surrounds a lumen, said wall formed of a flexible material that moves from an expanded position to a collapsed position as drug formulation leaves the container;

(ii) a passageway through the container, said passageway formed of a material that permits a fluid to enter the container and permits a fluid drug formulation to leave the container;

(iii) a beneficial drug in the container that forms a fluid drug formulation with fluid that enters the container; and,

(b) administering the drug to the animal by letting fluid enter the container to form the fluid drug formulation that, as the container collapses, leaves the container for administering to the animal.

4,511,353

INTRAVENOUS SYSTEM FOR DELIVERING A BENEFICIAL AGENT

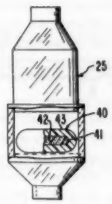
Felix Theeuwes, Los Altos, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 283,077, Jul. 13, 1981, abandoned. This application Oct. 9, 1981, Ser. No. 310,047
Int. Cl.³ A61M *5/14*
U.S. Cl. 604—85 **6 Claims**

1. A self-contained, self-powered beneficial, drug delivery system for use with an intravenous delivery system, the beneficial drug delivery system, comprising in combination:

(a) an intravenous formulation chamber comprising: a wall provided with an inlet that lets an intravenously acceptable medical fluid into the intravenous formulation chamber, and with an outlet for letting fluid leave the chamber; and,

(b) a drug delivery device in the intravenous formulation chamber, the device comprising an inner mass transfer conductor; a beneficial intravenously administrable drug in an amount for performing a therapeutic program with said intravenously administrable drug in the conductor



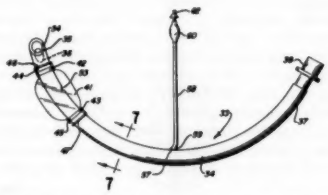
that is permeable to the passage of the drug; and, a membrane surrounding the conductor, which membrane release the drug in a therapeutically effective amount from the device into the medical fluid that is a pharmaceutically acceptable carrier for the drug and enters the intravenous, formulation chamber for formulating an intravenously administrable fluid drug formulation in situ that produces a beneficial effect, when administered intravenously to a recipient, over time.

4,511,354

HYDROCARBON BLOCK COPOLYMER WITH DISPERSED POLYSILOXANE

Robert E. Sterling, New Port Richey, Fla., assignor to Medical Research Associates, Ltd., Clearwater, Fla.

Division of Ser. No. 147,475, May 7, 1980, Pat. No. 4,386,179. This application Feb. 10, 1983, Ser. No. 465,586
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—98 **44 Claims**



1. An inflatable cuff in the form of a web surrounding a medical tubing, the ends of the web being sealed to said medical tubing to define an inflatable space, said cuff being formed of a composition comprising

an elastomeric, thermoplastic hydrocarbon block copolymer, said copolymer having a total molecular weight of about 50,000 to 600,000;

polysiloxane dispersed substantially uniformly throughout said copolymer, having a viscosity of about 20 to 13,000 centistokes, and comprising about 0.1 to 8 percent of the total weight of said composition; and

mineral oil dispersed substantially uniformly throughout said copolymer and comprising less than about 60 percent of the total weight of said composition.

4,511,355

INFUSION DEVICE INTENDED FOR IMPLANTATION IN A LIVING BODY

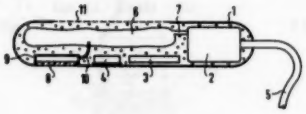
Manfred Franetzki, Uttenreuth, and Karl Prestele, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 15, 1982, Ser. No. 418,525

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138320

Int. Cl.³ A61M *5/14*

U.S. Cl. 604—131 **22 Claims**



1. An infusion device for implantation in a patient's body, comprising

a protective housing;

a flexible walled reservoir positioned within said housing, formed of a fluid impermeable material and adapted to contain an infusion liquid therein;

a conveying and dosing unit positioned within said housing for conveying said infusion liquid from said reservoir to a catheter discharge opening; and

means communicable with the interior of said reservoir for permitting refilling of said reservoir from exterior of said housing;

said protective housing having means providing communication between the interior of said housing exteriorly of said reservoir and bodily fluids exterior of said housing.

4,511,356

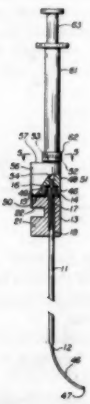
CANNULA, OBTURATOR, STYLET AND NEEDLE HUB CONNECTORS FOR LUMBAR DISC PUNCTURE

Edward C. Froning, P.O. Box 1768, Rancho Santa Fe, Calif. 92067, and Gregory S. Graham, Ventura, Calif., assignors to Edward C. Froning, Rancho Santo Fe, Calif.

Filed Feb. 22, 1983, Ser. No. 468,379

Int. Cl.³ A61M *5/00, 5/04*

U.S. Cl. 604—164 **11 Claims**



1. A canula for use with an instrument having a shaft, an instrument hub on said instrument having a socket in its bottom surface and an instrument vane extending laterally relative to said shaft, said instrument vane having first and second instrument vane sides, said instrument vane having a downward projection, said instrument vane being formed with a cut-away portion and having a lock wider than said cut-away portion below said cut-away portion comprising a lumen, said lumen being shaped to receive said shaft, a cannula hub on the proximal end of said lumen having a bore aligned with said lumen, a flat top, a hollow projection extending up from said top aligned with said bore shaped to fit into said socket and a cannula vane extending laterally relative to said lumen, said cannula vane having first and second cannula vane sides, said cannula vane being formed with a notch extending inward from the outer end of said cannula vane dividing said cannula vane into upper and lower portions, said notch being shaped to receive said lock, said upper portion being cut away on said first cannula vane side to about the vertical midsection of said cannula vane to fit against said cut-away portion of said instrument vane, said first and second cannula vane sides being parallel to said first and second instrument vane sides in the assembled position of said instrument and said cannula.

4,511,357

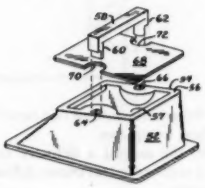
LIQUID DRAINAGE SYSTEM WITH A GUIDABLE VALVE ELEMENT

Carl J. Steigerwald, Wauconda, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Feb. 9, 1983, Ser. No. 465,123

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—323 **15 Claims**



1. A urine drainage system, comprising:

a receptacle having a chamber to receive urine, and a depending annular wall defining a valve seat at a lower portion thereof and an opening in the region of the seat;

a valve element comprising a sheet of flexible relatively stiff material being sufficiently large to extend across said opening and sealingly engage against said seat peripherally around the wall; and

means for retaining a central portion of the valve element adjacent to the seat comprising a generally straight bar extending completely across a central portion of the valve element and having a pair of boss member means adjacent opposed ends of the bar, said boss member means being secured to the receptacle wall, the valve element having a pair of arcuate cut-outs along the perimeter to coincide with the boss member means, the boss member means having an inner arcuate surface to conform to the arcuate cut-outs on the perimeter of the valve element to locate the valve element adjacent the valve seat and guide the movement of the valve element.

4,511,358

URINE BAG CARRIER WITH A STRETCHABLE FRONT PANEL

Clifford B. Johnson, Jr.; Barbara Johnson, both of 200 NE. Fifth Ave.; Alex Amadio, and Williane Amadio, both of 1120 S. Parrott Ave., all of Okeechobee, Fla. 33472

Filed Sep. 30, 1982, Ser. No. 430,843

Int. Cl.³ A61M *1/00*

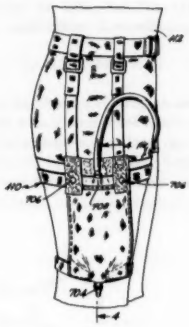
U.S. Cl. 604—327 **9 Claims**

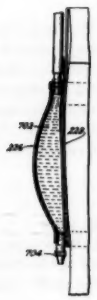
1. A pouch and support for a urine collection bag comprising:

a waist encircling belt having adjustable length;

a pouch for holding a urine bag, said pouch comprising front

and back panel means, the vertical edges and part of the bottom edge of said front and back panel means being sewn together to define a top opening and a centrally disposed bottom opening, said front panel means being formed entirely of a stretchable material to hold a urine bag firmly within said pouch and further to prevent a urine bag from bulging at the bottom portion thereof as the bag is filled with urine;





a plurality of vertical straps connecting said pouch to said belt, said vertical straps having variable lengths, and

top and botton leg encircling straps extending from the top and bottom portions of said pouch, respectively, for encircling the leg of the wearer, said leg encircling straps having adjustable lengths and being provided with fastener means.

4,511,359

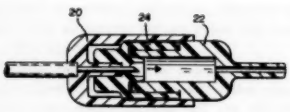
STERILE CONNECTION DEVICE

Vincent L. Vaillancourt, Livingston, N.J., assignor to Manresa, Inc., Hillsdale, N.J.

Filed Sep. 29, 1982, Ser. No. 426,260

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—411 **3 Claims**



1. A sterile connection device adapted for connecting a source of fluid from an influent connector to an effluent connector and providing a resilient protector member carried by the effluent connector, this protector member having an initially imperforiate barrier wall and when the connectors are brought to a closed condition a sharpened hollow needle carried by the influent connector penetrates said resilient barrier wall to establish a fluid flow path and when the connectors are caused to be separated the penetration of the barrier wall by the hollow needle is discontinued with the needle remaining in the influent connector, this withdrawal of the needle allowing the residual bias in the protector to close the penetration site in the barrier wall and provide exclusion of unwanted contaminants into the discharge conduit, said sterile connector device including:

(a) an influent connector providing a female configuration with a cylindrically-formed interior in which at least the outer portion thereof is formed with a precise diameter tubular skirt portion and made as a stepped configuration with a smaller diameter portion extending forwardly of and from the skirt portion and with this differential in diameters forming and providing a stop shoulder, said connector having the opposite end a closing end in which a sharpened hollow needle is carried in and by a post portion of a given extent, said post portion extending into the cylindrically-formed interior and with the sharpened needle extending from said post portion a short distance into said tubular skirt portion with the remaining skirt portion open to the end and providing a smooth circular cavity;

(b) a protector member of resilient material having sufficient residual bias to close an aperture formed in a barrier wall portion of said protector member, said aperture formed by an inserted needle carried in and by the influent connector, said protector member having a forward and a rearward end and of generally circular configuration, the rearward portion being a skirt having an interior diameter of precise size and with this rearward portion integrally connected to said forward portion, the forwardly extending portion of the resilient protector member being formed as a reduced diameter portion of the rearward skirt portion, with this reduced diameter providing a free fit in the smaller diameter stepped bore in the influent connector, and between the forwardly extending portion and the rearwardly extending skirt portion of the resilient protector member is a differential of diameters which provides a stop shoulder adapted to engage the stop shoulder in the influent connector to establish the limit for said closed condition and position;

(c) a substantially rigid effluent connector providing a male configuration with a fluid pathway and conduit formed in a rear-end portion thereof and with said pathway and conduit substantially central of said connector, said connector having a tubular forwardly extending portion and a larger rearwardly extending enlarged tubular portion providing a shoulder at the joining of said external portions, this forwardly tubular portion sized to releaseably retain the outer skirt portion of the protector member and providing therewith a friction fit with the outer surface diameter of tubular forwardly-extending portion of the effluent connector, the rearwardly enlarged portion of the effluent connector sized to provide a mating and sliding fit within the tubular skirt portion of the influent connector, and

(d) a forwardly-extending portion of the protector member sized to be a free sliding fit within the tubular skirt portion of the influent connector and forming in this forwardly-extending portion of the resilient protector member a central recess of a diameter to provide a free sliding fit on the post of the influent connector, said central recess of a depth sufficient to accept much of the post, with said extending portion of the resilient protector member and central recess therein providing means to prevent unwanted exposure to exterior contaminants, including fingers, when the influent connector and needle are removed, this recess terminating with said barrier wall which is of a thickness to be penetrated by the sharpened needle when the influent and effluent connectors are brought to closed condition.

4,511,360

DYEING COMPOSITIONS BASED ON OXIDATION DYESTUFF PRECURSORS AND ON NITRO BENZENE DYESTUFFS AND THEIR USE FOR DYEING KERATIN FIBRES

Christian Monnais, Neuilly-sur-Seine; Jean Cotteret, Franconville, and Andreè Bugaut, Boulogne-Billancourt, all of France, assignors to L'Oreal, Paris, France

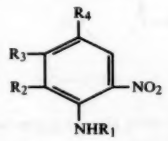
Filed Oct. 14, 1981, Ser. No. 311,309

Claims priority, application Luxembourg, Oct. 16, 1980, 82860

Int. Cl.[3] A61K *7/13*

U.S. Cl. 8—405 21 Claims

1. A composition suitable for dyeing human hair in a reducing alkaline medium which comprises 0.001 to 25% by weight of at least one oxidation base and at least one coupler as oxidation dyestuff precursors in combination with 0.005 to 3% by weight of at least one direct dyestuff, in an aqueous vehicle, said direct dyestuff being a nitro derivative of the formula:



(I)

in which either (i) R_1 denotes methyl, R_2 and R_4 denote hydrogen and R_3 denotes β-hydroxyethoxy, or (ii) R_1, R_3 and R_4 denote hydrogen and R_2 denotes methyl or hydroxyl, or (iii) R_1 and R_2 denote hydrogen, R_3 denotes methyl and R_4 denotes hydroxyl, (β-hydroxyethyl)-amino or (β-N,N-diethylaminoethyl)-amino, or (iv) R_1, R_2 and R_3 denote hydrogen and R_4 denotes N,N-bis-(β-hydroxyethyl)-amino.

4,511,361

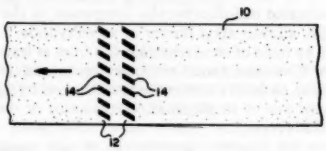
METHOD OF MARKING PAPERMAKERS' FELT BY TRANSFER PRINTING

Shirish M. Shah, Piqua, Ohio, assignor to The Orr Felt Company, Piqua, Ohio

Filed Apr. 27, 1984, Ser. No. 604,357

Int. Cl.[3] D06P *3/82;* D03D *23/00*

U.S. Cl. 8—471 5 Claims



1. The method of marking a papermaker's felt in which the felt is composed of synthetic fibers or a blend of synthetic and wool fibers, with alignment stripes extending transversely of the felt, comprising the steps of:

supporting the felt on a pair of rolls in tension,

applying a sheet having dye transfer color pigment printed thereon transversely of the felt on an inside surface thereof between said rolls,

applying heat to one of said rolls and rotating said rolls to cause said sheet to be brought between the felt and the heated roll, causing said sheet to dwell on said heated roll for a length of time sufficient to transfer the dye pigment therefrom to said inside felt surface, and

removing said paper.

4,511,362

FLUIDIZED BED DESULFURIZATION

Maddury Ravindram, Duarte, and John J. Kalvinskas, South Pasadena, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 26, 1983, Ser. No. 526,768

Int. Cl.[3] C10L *9/02*

U.S. Cl. 44—1 SR 11 Claims

1. A method of desulfurizing a particulate, carbonaceous material containing at least 0.2 percent by weight of sulfur comprising the steps of:

continuously suspending particles of the carbonaceous material in a common reactor vessel;

introducing an upwardly flowing column of chlorine gas at a temperature from 20° C. to 300° C. into the reactor vessel and chlorinating the material by suspending particles of the material in the upwardly flowing column of chlorine gas to form a fluidized bed and reacting chlorine with the material until at least 1 percent by weight of chlorine is added to the material; and

exchanging the chlorine gas with an inert gas at a temperature of at least 300° C. and dechlorinating the material by suspending the material in said inert gas until the chlorine content of the material is reduced below 1 percent by weight.

4,511,363

METHOD OF UPGRADING LOW-RANK COAL

Yoichi Nakamura; Akio Yamamoto, both of Kudamatsu; Shunsuke Nogita, Hitachi; Toshio Kuge, Hitachi, and Katsumi Muroi, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 23, 1983, Ser. No. 535,048

Claims priority, application Japan, Oct. 1, 1982, 57-170852

Int. Cl.[3] C10L *9/08*

U.S. Cl. 44—1 G 10 Claims

1. A method of upgrading low-rank coal comprising:

dehydrating low-rank coal in a drying section, by heating to a temperature of between 100° to 150° C. to remove moisture therefrom;

delivering the dehydrated coal from said drying section to a dry-distillation section;

dry-distilling said dehydrated coal by heating to a temperature of between 250°–450° C. in the dry-distillation section to produce dry-distilled coal and vapor containing tar;

delivering said dry-distilled coal from said dry-distillation section to a cooling section, cooling said dry-distilled coal in the cooling section and contacting the cooled dry-distilled coal with said vapor to enable the cooled dry-distilled coal to absorb tar from said vapor.

4,511,364

MIXED FUELS

Masaru Mitsumori, Miyazaki, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 1, 1982, Ser. No. 383,922

Claims priority, application Japan, May 29, 1981, 56-80827; Jul. 10, 1981, 56-106857

Int. Cl.[3] C10L *1/32*

U.S. Cl. 44—51 17 Claims

1. A thixotropic mixed fuel comprising coal, oil, water and a dispersion stabilizer wherein said coal is a powdered coal which can all pass through a 100-mesh screen, and said dispersion stabilizer is a water-insoluble fine particle having a colloid-forming ability, having a mean grain diameter of 20 μm or less, that is selected from the group consisting of (1) a water-insoluble natural polymeric compound and (2) a water-insolu-

ble polymeric compound prepared by a chemical treatment or dissolution and regeneration of a natural polymeric compound.

4,511,365

COAL-AQUEOUS MIXTURES

Seymour Mark, Wayne, Pa., assignor to Sohio Alternate Energy Development Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 416,606, Sep. 10, 1982, Pat. No. 4,441,889, which is a continuation-in-part of Ser. No. 230,062, Jan. 29, 1981, Pat. No. 4,358,293. This application Apr. 10, 1984, Ser. No. 598,601

Int. Cl.³ C10L *1/32, 1/18*

U.S. Cl. 44—51' 16 Claims

1. A stabilized, high solids content coal-aqueous mixture comprising particulate coal as a dispersed solid material; water as a carrier medium; a polyalkyleneoxide nonionic surfactant having a hydrophobic portion and a hydrophilic portion, said hydrophilic portion comprising at least about 100 units of ethylene oxide, said polyalkyleneoxide nonionic surfactant being present in said mixture in an amount sufficient to disperse said particulate coal in said water carrier; fuel oil and a viscosity stabilizer.

4,511,366

LIQUID FUELS AND CONCENTRATES CONTAINING CORROSION INHIBITORS

Aubrey L. Burrows, Bracknell; Paul B. Mabley, Hampton Hill, and Steven J. Field, Wokingham, all of England, assignors to Ethyl Petroleum Additives, Inc., Bracknell, England

Filed Dec. 16, 1983, Ser. No. 562,276

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—53 18 Claims

1. A liquid fuel adapted for use in an internal combustion engine said fuel comprising from 5 to 100 weight percent of one or more alcohols from 0 to 95 weight percent gasoline and a corrosion inhibiting amount of a combination of (A) a polymer of one or more C_{16} to C_{18} polyunsaturated aliphatic monocarboxylic acids and (B) a reaction product of (i) about one mole part of one or more polyalkylene polyamines having the formula $H_2N—RNH)_nH$ wherein n is an integer from 1 to about 8 and R is a divalent hydrocarbon group containing 2 to 4 carbon atoms, (ii) about 0.5 to 5 mole parts of one or more C_{10} to C_{20} monounsaturated aliphatic monocarboxylic acids or lower alkylesters thereof and (iii) 0 to about 4 mole parts of an alkenyl succinic anhydride wherein the alkenyl group contains about 8 to 30 carbon atoms.

4,511,367

CORROSION INHIBITORS FOR ALCOHOL CONTAINING MOTOR FUEL

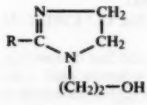
Gordon G. Knapp, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 13, 1984, Ser. No. 619,977

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—53 7 Claims

1. A liquid fuel adapted for use in an internal combustion engine, said fuel consisting essentially of 5 to 100 weight percent of one or more alcohols, 0 to 95 weight percent gasoline and a corrosion inhibiting amount of a combination of (A) at least one substituted imidazoline having the structural formula:



in which R is a hydrocarbon alkenyl group having from about 7 to 24 carbon atoms and (B) at least one monoalkenylsuccinic acid in which the alkenyl group contains about 8 to 30 carbon atoms.

4,511,368

CORROSION INHIBITORS FOR ALCOHOL-BASED FUELS

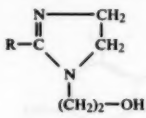
Gordon G. Knapp, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 18, 1984, Ser. No. 621,777

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—53 9 Claims

1. A liquid fuel adapted for use in an internal combustion engine, said fuel consisting essentially of 5 to 100 weight percent of one or more alcohols, 0 to 95 weight percent gasoline and a corrosion inhibiting amount of a combination of (A) a polymer of one or more C_{16} to C_{18} polyunsaturated aliphatic monocarboxylic acids and (B) at least one substituted imidazoline having the structural formula:



in which R is a hydrocarbon alkenyl group having from about 7 to about 24 carbon atoms.

4,511,369

COPOLYMERS WITH NITROGEN GROUPS, USEFUL AS ADDITIVES FOR DECREASING THE CLOUD POINT OF HYDROCARBON MIDDLE DISTILLATES AND COMPOSITIONS CONTAINING THEM

Jacques Denis, Charbonniere les Bains; Bernard Sillion, Rocquencourt; Bernard Damin, Oullins, and Robert Leger, Grigny, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Elf France, Paris, both of, France

Filed Nov. 9, 1983, Ser. No. 550,160

Claims priority, application France, Nov. 9, 1982, 82 18968

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—62 19 Claims

1. A composition, useful as an additive for decreasing the cloud point of middle distillates, having a number-average molecular weight of 1,000-10,000, and consisting essentially of a copolymer comprising:

20–40% by mole of recurrent units (A) from at least one linear α-olefin;

30–70% by mole of recurrent units (B) from at least one unsaturated α,β-dicarboxylic compound, in the form of a diacid, a lower alkyl diester or an anhydride;

5–30% by mole of recurrent units (C) from at least one alkyl ester of an unsaturated monocarboxylic acid; and

5–15% by mole of recurrent units (D) from styrene and/or at least one of its alkylated, halogenated or methoxlated derivatives,

wherein the dicarboxylic units (B) of said copolymer are condensed with at least one compound having a single primary amine group, having the formula:

$$R—Z[(CH_2)_nNH]_mH \quad (I)$$

or

$$HO—CH_2—R''—NH_2 \quad (II)$$

wherein R is a monovalent saturated aliphatic radical having 1–30 carbon atoms, Z is 0, NH or NR′, wherein R′ is a monovalent saturated aliphatic radical having 1–30 carbon atoms; n is an integer from 2 to 4; m is zero or an integer from 1 to 4 when Z is NH, or an integer from 1 to 4 when Z is 0 or NR″; and R″ is a divalent saturated aliphatic radical having 1–18 carbon atoms.

9. A middle distillate composition, which it comprises a

major proportion of middle distillate having a distillation range from 150° to 450° C. and a minor proportion of at least one composition according to claim 1 sufficient to decrease the cloud point thereof.

4,511,370

PROCESS FOR THE UTILIZATION OF HOUSEHOLD RUBBISH OR GARBAGE AND OTHER ORGANIC WASTE PRODUCTS FOR THE PRODUCTION OF METHANE GAS

Martin Hunziker, Speerstrasse 50, Zürich, and Albert Schildknecht, Dorfstrasse 45, Oetwil a.d.Limmat, both of Switzerland

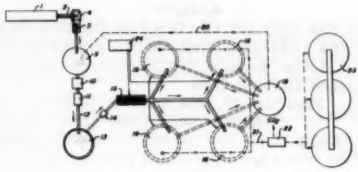
PCT No. PCT/CH81/00137, § 371 Date Aug. 4, 1982, § 102(e) Date Aug. 4, 1982, PCT Pub. No. WO82/02059, PCT Pub. Date Jun. 24, 1982

PCT Filed Dec. 4, 1981, Ser. No. 406,246

Claims priority, application Switzerland, Dec. 12, 1980, 9215/80

Int. Cl.³ C02F *11/04, 3/30;* C12P *5/02*

U.S. Cl. 48—197 A **11 Claims**



1. A process for producing methane gas comprising the following sequential steps:

agitating a slurry of crushed organic matter and water in a substantially air tight holding tank, by bubbling methane gas through the slurry, until anaerobic bacterial action commences, as indicated by a rise in temperature of the slurry to about 30° C.;

removing the slurry from the holding tank;

heating the slurry to about 55°–60° C.;

transferring the slurry to at least one substantially air tight reaction tank;

fermenting the slurry in said reaction under anaerobic conditions at a temperature of about 55°–60° C. and agitating it by bubbling methane gas through it, to promote production of methane gas;

separating the gaseous, liquid, and solid phases from each other; and

collecting the methane gas produced.

4,511,371

METHOD FOR PREVENTING PLUGGING OF A SLAG OUTLET IN A SUBSTOICHIOMETRIC SLAGGING COMBUSTOR

Henry J. Blaskowski, Avon, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 17, 1983, Ser. No. 467,429

Int. Cl.³ C10J *3/08*

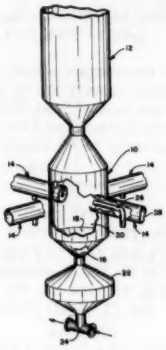
U.S. Cl. 48—197 R **5 Claims**

1. A method for preventing plugging of the slagging outlet by excessively viscous slag material in a slagging, substoichiometric combustor reacting a carbonaceous fuel with air, said air including a primary air stream and a secondary air stream, said primary air stream pneumatically conveying said fuel into said combustor, comprising the steps of:

observing the slagging conditions within said combustor for determining a threshold condition, wherein continued operation of said combustor under slagging conditions below the threshold condition results in the occurrence of an unacceptable likelihood of plugging of the slag outlet;

monitoring the current slagging conditions within said combustor to ascertain if the current condition is below the determined threshold condition;

injecting substantially pure oxygen, responsive to the monitoring step, into said primary air stream for increasing, at least locally, the reaction temperature within said combustor, thereby reducing slag viscosity within said combustor; and



ceasing the injection of the substantially pure oxygen upon improvement of the current slagging condition above the determined threshold condition.

4,511,372

CARBON GASIFICATION METHOD

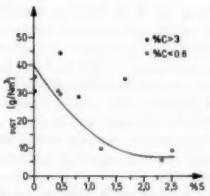
Carl-Lennart Axelsson, Stockholm, Sweden, assignor to IPS Interproject Service AB, Bettna, Sweden

Continuation of Ser. No. 379,787, May 19, 1982, abandoned. This application Jan. 27, 1984, Ser. No. 574,665

Claims priority, application Sweden, May 20, 1981, 8103201

Int. Cl.³ C10J *3/00*

U.S. Cl. 48—197 R **12 Claims**



1. In a method for gasifying carbon in the form of coal, hydrocarbons, and/or hydrocarbon compounds, in which carbon, oxygen and iron oxides are injected beneath the surface of a molten iron bath held in a reactor vessel so that the iron oxides constitute a coolant and are intended to be reduced, and the carbon is dissolved in the molten bath, the carbon being injected in a stoichiometric excess relative to the oxygen present in the bath in the form of oxides, the improvement comprising:

A. maintaining the total pressure in the reactor vessel greater than atmospheric pressure up to 50 bar;

B. maintaining the carbon concentration in the molten iron bath lower than 3% by weight carbon; and

C. maintaining the sulphur concentration in the molten ion bath in the range of about 0.5% to 2.5%, thereby enabling increase in the rate of gas production with reduction in dust formation.

4,511,373
FLUORINATED DIAMOND PARTICLES BONDED IN A FILLED FLUOROCARBON RESIN MATRIX

Gene W. Taylor, Los Alamos, and Herman E. Roybal, Santa Fe, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

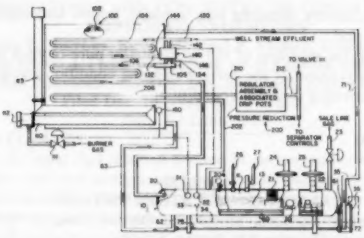
Filed Nov. 14, 1983, Ser. No. 551,528
Int. Cl.³ C09K *3/14*
U.S. Cl. 51—298 **23 Claims**

1. An article of manufacture which comprises a formed, filled fluorinated resin support matrix in which fluorinated diamond particles are bonded, said filler material being selected from the group consisting of Al_2O_3, B_4C and AlB_2, and comprising between about 20–40 weight percent of said filler material.

4,511,374
GAS TEMPERATURE CONTROL SYSTEM FOR NATURAL GAS SEPARATOR

Rodney T. Heath, 109 W. 31st, Farmington, N. Mex. 87401

Filed Feb. 17, 1984, Ser. No. 581,341
Int. Cl.³ B61D *19/00*
U.S. Cl. 55—20 **6 Claims**



6. A method of controlling the temperature of a body of relatively low pressure natural gas in a separator vessel means for separating liquids and gas in a relatively high pressure natural gas well head effluent and for controlling the temperature of a fluid heating medium in an heating vessel operatively associated with a relatively low pressure gas operated heating means for heating the fluid heating medium and operatively associated with supply gas conduit means for supplying relatively low pressure fuel gas to the gas operated heating means and operatively associated with a body of liquids in the separator vessel means, the method comprising:

heating the relatively high pressure well effluent by passing the well effluent through a first and a second heating coil means located in the heating vessel in heat transfer relationship with the fluid heating medium to provide heated well effluent;

delivering the heated well effluent to the separator vessel means and separating the heated well effluent into a body of liquids and a body of gas;

controlling the temperature of the body of liquids in the separator vessel by passing the fluid heating medium through conduit means located in the separator vessel in heat transfer relationship with the body of liquids;

heating the supply gas for the gas operated heating means by passing the supply gas through conduit means located in the heating vessel in heat transfer relationship with the fluid heating medium;

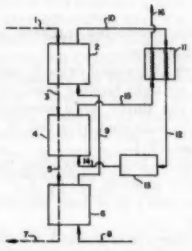
controlling the temperature of the fluid heating medium in the heating vessel by temperature sensing means located in the fluid heating medium in the heating vessel means during a first and third mode of operation wherein the fluid heating medium is maintained at a preset maximum temperature and by temperature sensing means located in the separator vessel means during a second mode of operation temperature is variably controlled below the preset maximum wherein the fluid heating medium temperature is variably controlled below the preset maximum temperature; and

controlling the temperature of the body of gas in the separator vessel by temperature sensing means located in the body of gas and a temperature responsive flow control means connected to the unheated well effluent upstream of the heating vessel means and the heated well effluent delivered from the first heating coil means by causing delivery to the second heating coil means of a variable mixture of unheated well effluent and heated well effluent in said first mode of operation and delivery to the second heating coil means of only unheated well effluent in said second mode of operation, and delivery to the second heating coil means of only heated well effluent in said third mode of operation, and by said variably controlling of the temperature of the fluid heating medium in the heating vessel during said second mode of operation; whereby the amount of heat transferred to effluent passing through said second coil means is variably controlled.

4,511,375
PROCESS AND APPARATUS FOR DIRECT HEAT TRANSFER TEMPERATURE SWING REGENERATION

William E. BeVier, Kenmore, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 29, 1984, Ser. No. 594,716
Int. Cl.³ B01D *53/08*
U.S. Cl. 55—28 **19 Claims**



1. A process for cleaning impurity-containing adsorbent by temperature swing regeneration comprising:

(a) providing impurity-containing adsorbent and clean purge gas;

(b) warming the impurity-containing adsorbent by direct heat transfer with warm purge gas to produce warm impurity containing adsorbent and cool purge gas;

(c) heating the cool purge gas to produce hot purge gas;

(d) cleaning the warm impurity-containing adsorbent by contact with the hot purge gas to produce clean adsorbent and impurity-containing purge gas; and

(e) cooling the clean adsorbent by direct heat transfer with the clean purge gas to produce clean cool adsorbent and the warm purge gas of step (2).

15. An apparatus for temperature swing regeneration of impurity-laden adsorbent by direct heat transfer with purge gas comprising: a vessel having a preheating zone, a stripping zone and a recuperating zone, said preheating zone having a gas outlet at one end and a gas inlet at the opposite end, said stripping zone having a gas inlet at one end and, at the other end, gas collection means in flow communication with a gas outlet, said recuperating zone having a gas inlet at one end and, at the other end, gas collection means in flow communication with a gas outlet, said recuperating zone gas outlet in flow communication with said preheating zone gas inlet.

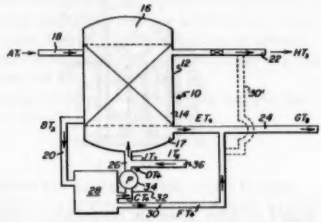
4,511,376
METHOD OF SEPARATING A NONCONDENSABLE GAS FROM A CONDENSABLE VAPOR

Glenn E. Coury, 6600 W. 13th Ave., Lakewood, Colo. 80214

Continuation of Ser. No. 311,810, Oct. 15, 1981, abandoned, which is a continuation of Ser. No. 138,007, Apr. 7, 1980, Pat. No. 4,330,007. This application Apr. 18, 1983, Ser. No. 485,598

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—36 **4 Claims**



1. The method of producing a clean steam from a gaseous mixture of steam and noncondensable gas including H_2S by separating the noncondensable gas from the steam in a continuous process, comprising:

(a) condensing steam from the gaseous mixture of steam and noncondensable gas on the first side of a two sided heat exchanger to form a condensate and a vent gas by

(1) directing the gaseous mixture along a flow path having condensing elements therein, and

(2) directing the condensate formed on said condensing elements in a substantially counter current flow to said flow path of the gaseous mixture so that the uncondensed gaseous mixture following the flow path strips noncondensable gases including substantially all of said H_2S from the condensate;

(b) removing the vent gas from the first side of the heat exchanger;

(c) removing the condensate from the first side of the heat exchanger;

(d) evaporating a portion of the condensate so removed by subjecting the condensate to a lower pressure than the pressure at which the gaseous mixture condenses; and

(e) cooling the second side of the heat exchanger with the liquid condensate remaining after the evaporating step while evaporating said remaining condensate into a clean steam containing relatively less noncondensable gas than said original gaseous mixture.

4,511,377
APPARATUS FOR THE PRODUCTION OF OXYGEN

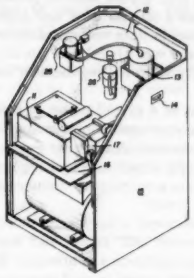
Norman R. McCombs, Tonawanda, N.Y., assignor to Greene & Kellogg, Inc., Tonawanda, N.Y.

Filed Nov. 1, 1983, Ser. No. 547,569

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—163 **12 Claims**

1. A modularized PSA machine comprising a housing; said machine comprising a single bed of adsorbent material, a surge tank, a process solenoid valve, and a pressure regulator; means to join said single bed, said surge tank, said process solenoid valve and said pressure regulator together into a single module, means to removably mount said single module into said housing; whereby said module may be pre-fabricated apart from said housing, and then easily removed from and replaced into



said housing to facilitate service and maintenance of said PSA machine.

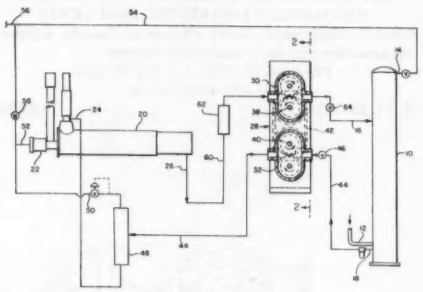
4,511,378
LIQUID-GAS CONTACTING APPARATUS AND PUMP THEREFOR

George J. Greene, 616 N. Eldridge, Houston, Tex. 77079

Continuation of Ser. No. 279,230, Jun. 30, 1981, abandoned. This application Apr. 7, 1983, Ser. No. 482,810

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—208 **4 Claims**



1. A glycol dehydrator, comprising

a contacting vessel having a gas inlet, a gas outlet, a lean glycol inlet, a wet glycol outlet and means within said vessel for providing contact between the gas and the glycol flowing therethrough,

a glycol regenerator,

a first time communicating between the wet glycol outlet and the glycol regenerator,

a second line communicating between the regenerator and the lean glycol inlet,

a gear motor in said first line,

a gear pump in said second line,

means connecting said motor to said pump whereby wet glycol and gas from said contacting vessel provides sufficient power to drive said pump to pump lean glycol into said contacting vessel,

a gas fired burner in contact with said glycol regenerator,

means in said first line between said gear motor and the regenerator for separating gas from wet glycol discharged from said gear motor, and

means for delivering said separated gas to said burner to provide at least a portion of the gas to fire said regenerator burner.

3. In a glycol dehydrator having,

a contacting vessel with a gas inlet and wet glycol outlet, and a gas outlet and lean glycol inlet; and

a glycol regenerator, a first flow line from the glycol regenerator to said lean glycol inlet to provide lean glycol to said vessel, and a second flow line from said wet glycol outlet and vessel in fluid communication with said regenerator to receive wet glycol and gas from the vessel and provide wet glycol to the regenerator for recirculation of the glycol;

the improvement of a glycol pump structure between said vessel and said regenerator comprising:

a positive displacement rotary gear pump in said first flow line between said vessel and said regenerator to provide during operation a continuous uninterrupted flow of lean glycol to said vessel;

a positive displacement rotary gear motor in said second flow line between said vessel and said regenerator to provide during operation a continuous flow of wet glycol and gas from said vessel to said regenerator; and

drive means connecting said rotary motor to said rotary pump whereby wet glycol and gas from said contacting vessel to said rotary motor provides sufficient power for said rotary motor to drive said rotary pump for pumping lean glycol into said contacting vessel;

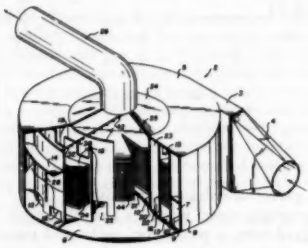
said rotary gear motor having a greater volumetric capacity than said rotary gear pump thereby permitting sufficient gas to pass through the rotary motor with the wet glycol to assure a continuous flow of lean glycol from the rotary pump to said contacting vessel at a preselected flow rate.

4,511,379

APPARATUS FOR TREATING FLUE GAS AND METHANOL CONTAINING EFFLUENTS

Edward G. Hauptmann, North Vancouver, Canada, assignor to Wescam Services Inc., Vancouver, Canada

Filed Jul. 8, 1982, Ser. No. 396,423
Int. Cl.³ B01D *47/00*
U.S. Cl. 55—238 **18 Claims**



1. A gas scrubber comprising a first chamber having:

(i) inner and outer concentric substantially circular side walls each of constant diameter;

(ii) a first end wall extending between corresponding end edges of the side walls;

(iii) a helical second end wall extending between corresponding end edges of the side walls and once thereabout to adjacent the first end wall;

(iv) a gas inlet in the outer wall adjacent the position of maximum height thereof, the gas inlet being positioned so as to direct gas passing therethrough tangentially between the side walls;

(v) fluid nozzles disposed on the inner wall so as to spray liquid toward the outer wall;

(vi) gas outlets extending substantially around a side wall and dimensioned so that the velocity of the gas flowing between the walls is substantially constant; and

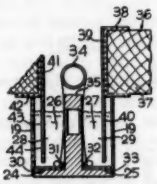
(vii) liquid outlet means to allow liquid to leave the gas scrubber.

4,511,380

SUSPENSION AND SEALING OF LATTICEWORK AND FILTERS

Stephen M. Fetter, Louisville, Ky., assignor to Allis-Chalmers Corp., Milwaukee, Wis.

Filed Dec. 15, 1983, Ser. No. 561,883
Int. Cl.³ B01D *46/00*
U.S. Cl. 55—355 **10 Claims**



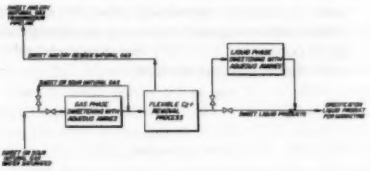
1. A sealed air filter assembly comprising, a suspended latticework of a plurality of filter supporting members running lengthwise and crosswise, each member defining a vertical center wall with lateral horizontal base flanges forming an inverted T-shaped cross section, said filter supporting members defining a plurality of filter openings, an angle frame received in each of said openings forming a perimeter channel chamber receiving sealant, a caulking compound between the lateral base flanges and the angle frames sealing the bottom of the channel chambers, a plurality of filter elements, a peripheral flange on each filter element extending into a perimeter channel chamber thereby providing a sealed filter assembly.

4,511,381

PROCESS FOR EXTRACTING NATURAL GAS LIQUIDS FROM NATURAL GAS STREAMS WITH PHYSICAL SOLVENTS

Yuv R. Mehra, Odessa, Tex., assignor to El Paso Hydrocarbons Company, Odessa, Tex.

Continuation-in-part of Ser. No. 374,270, May 3, 1982, Pat. No. 4,421,534. This application Jun. 24, 1983, Ser. No. 507,564
The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.
Int. Cl.³ F25J *3/02*
U.S. Cl. 62—17 **36 Claims**



1. In a process for the removal of natural gas liquids comprising hydrocarbons heavier than methane from a natural gas stream, wherein a need exists for recovering to any selected degree and at extremely high recoveries a selected hydrocarbon component and heavier hydrocarbons within the group consisting of ethane, propane, butane, and pentane without the need simultaneously to recover hydrocarbons lighter than said selected hydrocarbon component from said natural gas stream, the improvement comprising: providing the capability of selectively extracting said natural gas liquids from said natural gas stream with a physical solvent according to said selected degree of (a) ethane in amounts ranging from 2–98%, (b) propane in amounts ranging from 2–99%, (c) butane in amounts ranging from 2–100%; or (d) pentanes

and higher molecular weight hydrocarbons in amounts ranging up to 100% by:

(1) contacting said natural gas stream with said physical solvent at flow rates within the range of 0.005–0.5 gallon of solvent per standard cubic foot of natural gas to produce a residue natural gas stream of pipeline specifications and a rich solvent stream containing ethane and heavier hydrocarbon components, said solvent being selective for ethane and heavier hydrocarbon components of the gas stream such that the relative volatility of methane over ethane is at least 5.0 and the hydrocarbon loading capacity, defined as solubility of ethane in solvent, is at least 0.25 standard cubic feet of ethane per gallon of solvent;

(2) selectively flashing said rich solvent stream to produce a gas fraction and said solvent; and

(3) compressing, cooling, and condensing said gas fraction to obtain said natural gas liquids.

4,511,382

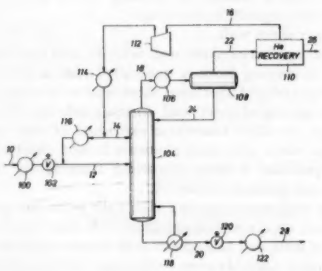
METHOD OF SEPARATING ACID GASES, PARTICULARLY CARBON DIOXIDE, FROM METHANE BY THE ADDITION OF A LIGHT GAS SUCH AS HELIUM

Jaime A. Valencia, Sugarland, and Robert D. Denton, Houston, both of Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Sep. 15, 1983, Ser. No. 532,343

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—20 **17 Claims**



10. A method for the separation of a feedstream containing methane and carbon dioxide in a cryogenic distillation tower without producing solid carbon dioxide comprising the steps of:

cooling said feedstream by heat exchange,

expanding said feedstream through expansion means,

introducing a diluent stream containing helium to said feedstream in amounts sufficient to raise the critical pressure of the resulting tower feed enough to preclude formation of solid carbon dioxide within said tower,

distilling said tower feed in a cryogenic distillation tower wherein at least a portion of said distillation tower is operated at a pressure higher than the critical pressure of the carbon dioxide and methane mixture contained therein calculated without the inclusion of helium to produce a bottoms stream containing a major portion of the carbon dioxide in said feedstream and an overhead stream containing a major portion of the methane in said feedstream,

condensing at least a portion of said overhead stream and recycling the condensed overhead stream as reflux in said distillation tower,

separating the remaining uncondensed portion of said overhead stream into a helium gas recycle stream and methane product stream, and

compressing at least a portion of said helium gas recycle stream for mixing with said feedstream as said diluent stream.

4,511,383

METHOD FOR PRODUCING GLASS FIBER

Mohinder S. Bhatti, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 14, 1983, Ser. No. 513,890

Int. Cl.³ C03B *37/085*

U.S. Cl. 65—6 **11 Claims**

1. In a method of making glass fibers comprising; supplying a stream of molten glass to a rotating rotor; discharging said glass through orifices in said rotor as a plurality of primary streams; and attenuating said primary streams into fibers, the improvement comprising electropolishing said rotor sufficient to substantially reduce the percentage of ultrafine fibers produced therefrom.

4,511,384

THERMALLY TOUGHENING GLASS

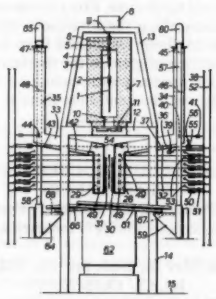
John Evason, Southport; Malcolm J. Rigby, St. Helens, and Peter Ward, Garswood, near Wigan, all of England, assignors to Pilkington Brothers P.L.C., St. Helens, England

Filed Jan. 26, 1983, Ser. No. 460,994

Claims priority, application United Kingdom, Feb. 1, 1982, 8202768; Oct. 11, 1982, 8229004

Int. Cl.³ C03B *27/04*

U.S. Cl. 65—114 **24 Claims**



13. A method of thermally toughening a glass sheet, comprising suspending a hot glass sheet between two vertical arrays of nozzles, supplying to each array of nozzles a flow from a falling supply of aerated particulate material, projecting from said nozzles towards the surfaces of the glass a plurality of streams of closely-packed, aerated particles, and supplying additional gas into the flows adjacent the arrays of nozzles to project those streams at a velocity which ensures that the integrity of each stream is preserved in its trajectory towards the glass.

16. Apparatus for thermally toughening glass, comprising

means for containing a supply of aerated particulate material;

gas supply means located in said containing means for pressurizing said supply of aerated particulate material;

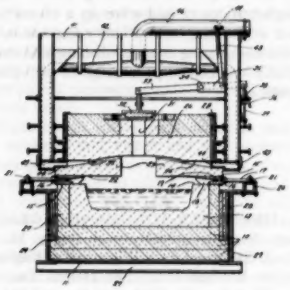
means for generating from that supply in said containing means an array of streams of closely-packed, aerated particles, and for projecting those streams towards a surface of the glass; and means for regulating the pressurizing of said supply of aerated particulate material thereby regulating the voidage fraction of each stream in the range 0.9 to 0.4 and the velocity of projection of each stream with a stream velocity which ensures that the integrity of each stream is preserved in its trajectory towards the glass without detriment to the surface quality of the glass.

4,511,385

FOREHEARTH FOR MOLTEN GLASS AND METHOD OF USING SAME

Marvin L. Barkhau, Elmore, and Joseph J. Kujawa, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 17, 1983, Ser. No. 542,319
Int. Cl.³ C03B *5/04*
U.S. Cl. 65—135 **5 Claims**



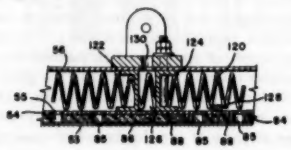
5. A method of controlling the temperature of molten glass in an elongated, forehearth channel comprising the steps of, introducing unheated cooling air directly through a plurality of flue blocks that extend over the forehearth channel toward the centerline of the forehearth, firing a combustible mixture at a plurality of points along the forehearth length beneath the flue blocks while confining the flames from the combustion to principally the surface of glass in the forehearth, and exhausting the combustion products and cooling air through the roof of the forehearth over the centerline thereof.

4,511,386

DEFORMABLE VACUUM HOLDER USED TO SHAPE GLASS SHEETS

John D. Kellar, Pontypool, and Gordon F. Pereman, Columbus, both of Canada, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 24, 1983, Ser. No. 496,223
Int. Cl.³ C03B *23/035*
U.S. Cl. 65—273 **16 Claims**



1. A deformable vacuum holder for use in the shaping of a heat deformable material comprising:

a box having an upper sheet wall, a perforated lower sheet wall and a spacer wall means connecting said upper and lower sheet walls in spaced relation to provide a vacuum type chamber, each of said walls being of material of sufficient flexibility to permit said box to be positively deformed to a configuration different from its original configuration;

means adapted to communicate said chamber with a vacuum source;

a flexible perforated sheet of insulated material with perforations that remain open during the bending of said mold and shaping of said sheet;

means to mechanically secure said flexible perforated sheet against said perforated lower sheet wall with the perforations of said flexible perforated sheet substantially aligned with the perforations of said lower perforated sheet wall; and

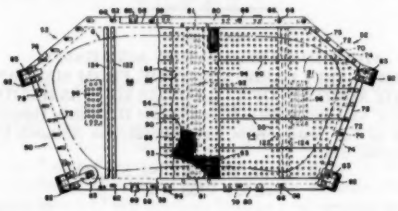
means to positively deform said box and said flexible perforated sheet of insulated material.

4,511,387

VACUUM HOLDER WITH ANTI-BULGING MEANS USED TO SHAPE GLASS SHEETS

John D. Kellar, Pontypool, and Gordon F. Pereman, Columbus, both of Canada, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 24, 1983, Ser. No. 496,224
Int. Cl.³ C03B *23/035*
U.S. Cl. 65—287 **18 Claims**



1. A vacuum holder for holding sheets of heat softened material thereagainst comprising:

an upper sheet wall;

a lower apertured sheet wall with at least one longitudinal slit extending from a generally transversely extending portion of said apertured sheet wall to an edge portion of said apertured sheet wall, forming side by side elongated strips, to allow transverse expansion of said lower apertured sheet wall upon exposure to said sheet at softening temperature without distorting transversely to a shape beyond desired tolerances;

spacer wall means spacing said walls from one another;

means to secure said upper sheet wall, said lower apertured sheet wall, and said spacer wall means together to form a chamber therebetween so that said lower apertured sheet wall is free to expand longitudinally without distorting to a shape beyond desired tolerances; and

means adapted to communicate said chamber with a vacuum source.

4,511,388

PRODUCTION OF HIGH-ANALYSIS AMMONIUM ORTHOPHOSPHATE SUSPENSION FERTILIZERS BY A NEW BATCH-TYPE PROCESS

Thomas M. Jones, Sheffield, and Lucian A. Kendrick, Jr., Florence, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 546,261, Oct. 28, 1983, Pat. No. T104,501. This application Feb. 27, 1984, Ser. No. 584,285
Int. Cl.³ C05B *7/00*
U.S. Cl. 71—34 **10 Claims**

1. A batch-type process for the production of suspension type fertilizers from ammonia and wet-process phosphoric acid or solid particles derived from such wet-process phosphoric acid, or mixtures thereof, which suspensions have high plant food contents, excellent flow properties, low viscosities, good storage properties, and do not contain settled crytals after exposure to substantial vibration, which process comprises the steps of:

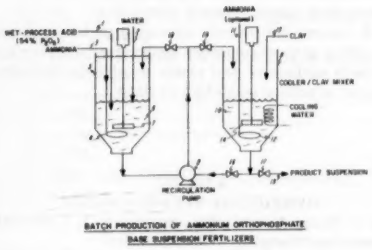
(1) maintaining in reactor means as a first heel of material therein predetermined quantities of at least partially ammoniated wet-process phosphoric acid, ammoniated materials derived from wet-process phosphoric acid, or ammo-

niated mixtures thereof, said first heel of material effected by the performance of step 5, infra;

(2) introducing in predetermined proportions a stream of ammonia, of water, and of wet-process phosphoric acid or solid particles of material derived from wet-process phosphoric acid, or mixtures thereof, into contact with said first heel of material maintained in said reactor means to effect at least a partially ammoniated feed phosphoric acid material therein having a N:P_2O_5 weight ratio ranging from about 0.26 to about 0.3, the volume ratio of the aggregate of said proportions of ammonia, water, and acid or materials derived therefrom, to said first heel of material ranging from about 0.67:1 to about 4:1;

(3) maintaining the temperature of the material in said reactor means, after the introduction of said proportions of ammonia, water, and phosphoric acids or solids derived therefrom, in the range from about 200° F. to about 230° F., and retaining same therein for a time ranging from about 10 minutes to about 45 minutes;

(4) removing from said reactor means a portion of said at least partially ammoniated material and introducing same,



BATCH PRODUCTION OF AMMONIUM ORTHOPHOSPHATE BASE SUSPENSION FERTILIZERS

along with clay or clay and predetermined quantities of ammonia into contact with a second heel of material maintained in cooling means, said second heel of material effected by the performance of step 8 infra, the volume ratio of the aggregate of said at least partially ammoniated material, clay or clay and ammonia, to said second heel of material ranging from about 0.67:1 to about 4:1;

(5) reserving that portion of said at least partially ammoniated material remaining in said reactor means as said first heel of material maintained therein in step 1 supra;

(6) maintaining the temperature of the materials in said cooling means, after the introduction of said at least partially ammoniated material, clay, or clay and ammonia, in the range from about 100° F. to about 140° F. for a period of time ranging from about 5 minutes to about 30 minutes;

(7) removing from said cooling means a portion of the resulting ammoniated and cooled product suspension and transferring same to product storage; and

(8) reserving that portion of the resulting cooled product suspension remaining in said cooling means as said second heel of material maintained therein in step 4, supra.

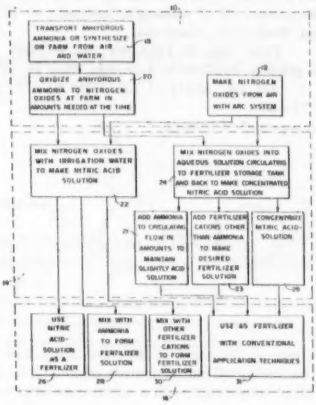
4,511,389
MANUFACTURING AND USING NITROGEN FERTILIZER SOLUTIONS ON A FARM

John A. Eastin, P.O. Box 389, Lincoln, Nebr. 69140

Division of Ser. No. 379,466, May 18, 1982, Pat. No. 4,435,201, which is a continuation-in-part of Ser. No. 100,825, Dec. 6, 1979, abandoned, which is a continuation of Ser. No. 824,289, Aug. 15, 1977, abandoned, which is a continuation of Ser. No. 728,788, Oct. 1, 1976, abandoned, which is a division of Ser. No. 581,050, May 27, 1975, abandoned. This application Jun. 23, 1983, Ser. No. 507,166

Int. Cl.[3] **C05C** *3/00*

U.S. Cl. 71—54 **26 Claims**


TRANSPORT ANHYDROUS AMMONIA OR SYNTHESIZE ON FARM FROM AIR AND WATER
OXIDIZE ANHYDROUS AMMONIA TO NITROGEN OXIDES AT FARM IN AMOUNTS NEEDED AT THE TIME
MAKE NITROGEN OXIDES FROM AIR WITH ARC SYSTEM
MIX NITROGEN OXIDES WITH IRRIGATION WATER TO MAKE NITRIC ACID SOLUTION
MIX NITROGEN OXIDES INTO AQUEOUS SOLUTION CIRCULATING TO FERTILIZER STORAGE TANK AND BACK TO MAKE CONCENTRATED NITRIC ACID SOLUTION
ADD AMMONIA TO CIRCULATING FLOW IN AMOUNTS TO MAINTAIN SLIGHTLY ACID SOLUTION
ADD FERTILIZER CATIONS OTHER THAN AMMONIA TO MAKE DESIRED FERTILIZER SOLUTION
CONCENTRATE NITRIC ACID SOLUTION
USE NITRIC ACID SOLUTION AS A FERTILIZER
MIX WITH AMMONIA TO FORM FERTILIZER SOLUTION
MIX WITH OTHER FERTILIZER CATIONS TO FORM FERTILIZER SOLUTION
USE AS FERTILIZER WITH CONVENTIONAL APPLICATION TECHNIQUES

1. Apparatus for nitrogenous fertilizing comprising:

means for oxidizing between 12.5 pounds and 146 pounds of nitrogen each hour in a continuous process by burning ammonia;

means for bringing the nitrogen oxides formed by burning the ammonia in contact with a surface catalyst and flowing water in a continuous process as the nitrogen oxides are formed to form a dilute solution of nitric acid in a continuous stream; and

means for using the dilute solution of nitric acid in a process leading to and including the application of nitrogeneous fertilizer on a farm.

4,511,390
ARALKYLCARBAMOYL PEPTIDE ALCOHOLS

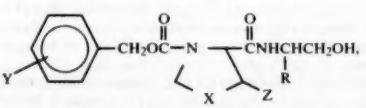
James C. Kauer, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 10, 1983, Ser. No. 503,295

Int. Cl.[3] **A01N** *43/36, 43/76, 43/78;* **C07D** *207/02*

U.S. Cl. 71—88 **24 Claims**

1. A compound of the formula



wherein

X is CH_2, O or S;

Y is H or an ortho, meta or para substituent selected from the group consisting of F, Cl, and alkyl groups of 1 to 4 carbons;

Z is H or CH_3; and

R is H or an alkyl group of 1 to 4 carbons.

9. A composition for enhancement of nitrate and ammonium ion uptake by plants, comprising an agriculturally acceptable diluent and an effective amount of a compound of claim 1 for ion uptake enhancement.

17. A method of enhancing nitrate and ammonium ion uptake by plants, comprising contacting plants with an effective amount of a composition of claim 9.

4,511,391

CYCLOHEXANE-1,3-DIONE DERIVATIVES AND THEIR HERBICIDAL COMPOSITIONS AND METHODS

Alexander Serban, Doncaster; Keith G. Watson, Box Hill North; Graham J. Bird, North Melbourne, and Graeme J. Farquharson, Reservoir, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

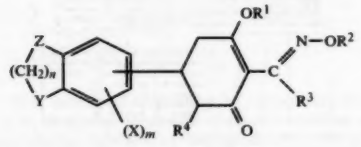
Filed May 24, 1983, Ser. No. 497,683

Claims priority, application Australia, May 24, 1983, PF4118

Int. Cl.[3] **A01N** *43/12;* **C07D** *307/78*

U.S. Cl. 71—88 **12 Claims**

1. A compound of formula I



wherein:

X, which may be the same or different, are selected from the group consisting of: halogen; nitro; cyano; C_1 to C_6 alkyl; C_1 to C_6 alkyl substituted with a substituent selected from the group consisting of halogen, nitro, hydroxy, C_1 to C_6 alkoxy, and C_1 to C_6 alkylthio; C_2 to C_6 alkenyl; C_2 to C_6 alkynyl; hydroxy; C_1 to C_6 alkoxy; C_1 to C_6 alkoxy substituted with a substituent selected from halogen and C_1 to C_6 alkoxy; C_2 to C_6 alkenyloxy; C_2 to C_6 alkynyloxy; C_2 to C_6 alkanoyloxy; (C_1 to C_6 alkoxy)carbonyl; C_1 to C_6 alkylthio; C_1 to C_6 alkylsulfinyl; C_1 to C_6 alkylsulfonyl; sulfamoyl; N-(C_1 to C_6 alkyl)sulfamoyl; N,N-di(C_1 to C_6 alkyl)sulfamoyl; benzyloxy; substituted benzyloxy wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, nitro, C_1 to C_6 alkyl, C_1 to C_6 alkoxy and C_1 to C_6 haloalkyl; the group NR^5R^6 wherein R^5 and R^6 are independently selected from the group consisting of hydrogen, C_1 to C_6 alkyl, C_2 to C_6 alkanoyl, benzoyl and benzyl; the group $—C(R^7)=NR^8$ wherein R^7 is selected from hydrogen and C_1 to C_5 alkyl and R^8 is selected from the group consisting of hydrogen, C_1 to C_6 alkyl, phenyl, benzyl, hydroxy, C_1 to C_6 alkoxy, phenoxy and benzyloxy;

Y and Z are independently selected from methylene, oxygen and sulfur provided that at least one of Y and Z is selected from oxygen and sulfur;

R^1 is selected from the group consisting of: hydrogen; C_1 to C_6 alkyl; C_2 to C_6 alkenyl; C_2 to C_6 alkynyl; substituted C_1 to C_6 alkyl wherein the alkyl group is substituted with a substituent selected from the group consisting of C_1 to C_6 alkoxy, C_1 to C_6 alkylthio, phenyl and substituted phenyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, nitro, cyano, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy and C_1 to C_6 alkylthio; C_1 to C_6 (alkyl)sulfonyl; benzenesulfonyl; substituted benzenesulfonyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, nitro, cyano, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy and C_1 to C_6 alkylthio; C_2 to C_6 alkanoyl; benzoyl and substituted benzoyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, nitro, cyano, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy and C_1 to C_6 alkylthio; 2-furoyl; 3-furoyl; 2-thenoyl; 3-thenoyl; and an inorganic or an organic cation selected from the alkali metal ions, the alkaline earth metal ions, transition metal ions and the ammonium ion $R^9R^{10}R^{11}R^{12}N^{\oplus}$ wherein R^9, R^{10}, R^{11} and R^{12} are independently selected from the group consisting of: hydrogen; C_1 to C_{10} alkyl; substituted C_1 to C_{10} alkyl wherein the alkyl group is substituted with a substituent selected from the group consisting of hydroxy, halogen and C_1 to C_6 alkoxy; phenyl; benzyl; and the groups substituted phenyl and substituted benzyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, nitro, cyano, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy and C_1 to C_6 alkylthio;

R^2 is selected from the group consisting of: C_1 to C_6 alkyl; C_2 to C_6 alkenyl; C_2 to C_6 haloalkenyl; C_2 to C_6 alkynyl; C_2 to C_6 haloalkynyl; substituted C_1 to C_6 alkyl wherein the alkyl group is substituted with a substituent selected from the group consisting of halogen, C_1 to C_6 alkoxy, C_1 to C_6 alkylthio, phenyl and substituted phenyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, nitro, cyano, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy and C_1 to C_6 alkylthio;

R^3 is selected from the group consisting of: C_1 to C_6 alkyl; C_1 to C_6 fluoroalkyl; C_2 to C_6 alkenyl; C_2 to C_6 alkynyl; and phenyl;

R^4 is selected from the group consisting of: hydrogen; halogen; cyano; C_1 to C_6 alkyl; and (C_1 to C_6 alkoxy)carbonyl;

n is an integer selected from 1 to 3; and

m is zero or an integer selected from 1 to 3.

10. A process for severely damaging or killing unwanted plants which process comprises applying to said plants, or to the growth medium of said plants, an effective amount of a compound as defined according to claim 1.

4,511,392

HERBICIDAL SULFONAMIDES

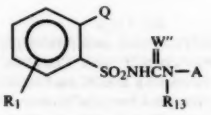
Morris P. Rorer, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 337,934, Jan. 7, 1982, abandoned. This application Oct. 29, 1982, Ser. No. 436,631

Int. Cl.[3] **C07D** *403/10;* **A01N** *90/12*

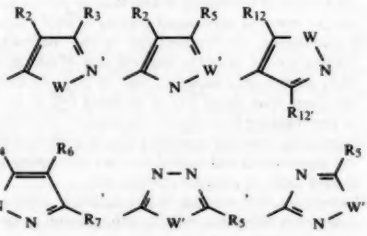
U.S. Cl. 71—90 **39 Claims**

1. A compound of the formula:

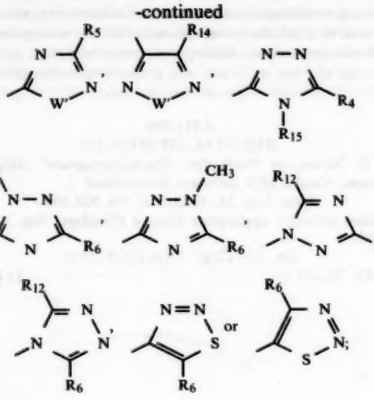


where

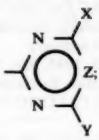
Q is



-continued



W'' is O or S;
W is O, S or NR;
W' is O or S;
R is H or C_1–C_4 alkyl;
R_1 is H, F, Cl, Br, CH_3, CF_3 or OCH_3;
R_2 is H, CH_3, C_2H_5, Cl or Br;
R_3 is H, CH_3, C_2H_5, Cl, Br, OCH_3, OC_2H_5 or SCH_3;
R_4 is H or C_1–C_4 alkyl;
R_5 is H, CH_3, C_2H_5, Cl, Br, OCH_3, OC_2H_5 or SCH_3;
R_6 is H, CH_3 or C_2H_5;
R_7 is H or C_1–C_4 alkyl;
R_{12} is H or CH_3;
R_{12}' is H or CH_3;
R_{13} is H or CH_3;
R_{14} is H, CH_3, C_2H_5, Cl, OCH_3, OC_2H_5 or SCH_3;
R_{15} is C_1–C_3 alkyl;
A is

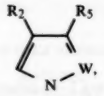


X is CH_3, OCH_3 or Cl;
Y is CH_3, C_2H_5, CH_2OCH_3, OCH_3, OC_2H_5, $CH(OCH_3)_2$, NH_2, $NHCH_3$, $N(CH_3)_2$, $OCH_2CH_2OCH_3$, OCH_2CF_3, SCH_3, CF_3 or

Z is CH;
and their agriculturally suitable salts; provided that
(a) when R_2 is Cl or Br, then W is O or S;
(b) when X is Cl, then Y is OCH_3, OC_2H_5, NH_2, $NHCH_3$ or $N(CH_3)_2$;
(c) when W'' is S, then R_{13} is H and Y is CH_3, OCH_3, C_2H_5, OC_2H_5, CH_2OCH_3, $CH(OCH_3)_2$ or

(d) when Q is

then one of R_2 or R_3 must be H, CH_3 or C_2H_5;
(e) when Q is



then one of R_2 or R_5 must be H, CH_3 or C_2H_5;
(f) the total number of carbon atoms of Q must be less than or equal to 8.

35. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim **1**.

4,511,393

3-CHLORO-8-CYANOQUINOLINES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Helmut Hagen, Frankenthal; Jüergen Markert, Mutterstadt; Rolf-Dieter Kohler, Edingen-Neckarhausen, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

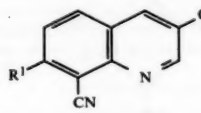
Filed Mar. 23, 1983, Ser. No. 477,964

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210979

Int. Cl.[3] **A01N** *43/48, 43/40;* **C07D** *215/20*

U.S. Cl. 71—92 **8 Claims**

1. A 3-chloro-8-cyanoquinoline of the formula,



(I)

where R^1 is $—NR^2R^3$, and R^2 and R^3 are identical or different and are each hydogen, C_1–C_8-alkyl, C_2–C_6-alkenyl, C_1–C_6-hydroxyalkyl, ω-dialkylamino-C_1–C_6-alkyl, formyl, cyclohexyl or phenyl, or together are tetramethylene or pentamethylene, and one methylene group in these radicals can be replaced by oxygen, nitrogen or $—N(CH_3)$.

8. A process for combating the growth of unwanted plants, wherein the plants and/or their location are treated with a herbicidally effective amount of a 3-chloro-8-cyanoquinoline of the formula I as claimed in claim **1**.

4,511,394
SUBSTITUTED BENZYLOXY CHLOROETHOXY ETHANE HERBICIDE ANTIDOTES

Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Co., Westport, Conn.

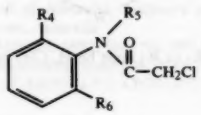
Division of Ser. No. 244,453, Mar. 16, 1981, Pat. No. 4,400,204. This application Mar. 24, 1983, Ser. No. 478,389

Int. Cl.³ A01N *37/34, 37/18*

U.S. Cl. 71—105 **8 Claims**

1. A herbicidal composition for use on wheat comprising:

(a) an herbicidally effective amount of an acetanilide compound of the formula

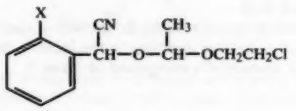


in which

R_4 and R_6 are independently alkyl having 1–2 carbon atoms, inclusive; and

R_5 is alkoxyalkyl having 2–4 carbon atoms, inclusive; and

(b) a non-phytotoxic antidotally effective amount of a compound of the formula



in which X is chlorine, bromine or iodine.

4,511,395
METHOD FOR THE PREPARATION OF WATER DISPERSIBLE GRANULAR HERBICIDAL COMPOSITIONS WITH INCREASED THERMAL STABILITY

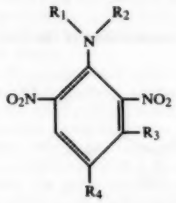
John Misselbrook, Lambertville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 20, 1982, Ser. No. 451,140

Int. Cl.³ A01N *25/22*

U.S. Cl. 71—121 **11 Claims**

1. A method for the preparation of heat stable water-dispersible granular compositions, said method comprising: melting about 50% to 70%, by weight, of a low-melting substituted compound of structural formula (I),



(I)

wherein R_1 is hydrogen, C_1–C_4 straight or branched-chain alkyl, C_3–C_4 alkenyl or C_3–C_4 alkynyl; R_2 is C_1–C_6 straight or branched-chain alkyl and optionally substituted with Cl or OCH_3, C_3–C_4 alkenyl or C_3–C_4 alkynyl; R_3 is hydrogen, CH_3 or CH_2OCH_3; R_4 is C_1–C_4 alkyl, CF_3 or Cl; mixing with said melt, on a weight basis, 0.0% to 3% sodium dioctyl sulfosuccinate; 2% to 7.5% of a wetting agent selected from sodium N-methyl-N-oleoyltaurate, octylphenoxy polyethoxy ethanol and nonylphenoxy polyethoxy ethanol; 2% to 6% of a dispersing agent selected from sodium lignin sulfonate and the sodium salt of a naphthalene sulfonic acid-formaldehyde condensate; 0.0% to 7.5% of a hydrophilic precipitated silica; and naturally occurring swelling hydrous aluminum silicate clay, in amounts sufficient to total the composition to 100%; cooling the thus-obtained composition; milling said composition to a particle size range of 5 μm to 10 μm; and granulating same with water.

4,511,396
REFINING OF METALS

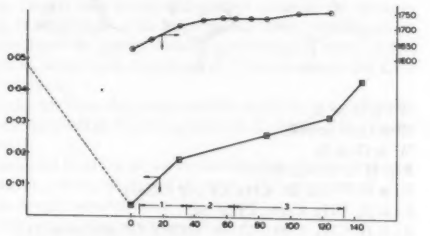
Ivor G. Nixon, ler Stock Ost "Matterhorngruss", Steinmattstrasse, Valais, 3920 Zermatt, Switzerland

Filed Aug. 24, 1983, Ser. No. 525,965

Claims priority, application United Kingdom, Sep. 1, 1983, 8224950

Int. Cl.³ C21C *7/00;* **C22B** *9/10*

U.S. Cl. 75—51.1 **12 Claims**



1. A method for the refining of a steel melt with a blow gas in the presence of a flux in which said flux is a dual basicity (DB) flux, a major proportion of which comprises one or more primary flux components having a basicity/activity which is equal to or lower then that of lime and a minor proportion of which comprises one or more secondary flux components having a basicity/activity higher than that of lime.

4,511,397
PROCESS FOR INCREASING THE DEGREE OF AFTERBURNING OF CARBON MONOXIDE IN THE REFINING OF IRON MELTS

Antoine Weiner, Luxembourg, Luxembourg, assignor to Arbed S.A., Luxembourg, Luxembourg

Filed Oct. 5, 1983, Ser. No. 539,260

Claims priority, application Luxembourg, Oct. 6, 1982, 84409

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—59.17 **7 Claims**

1. A process for increasing the extent of afterburning of carbon monoxide formed during decarburization of iron by the action of oxygen including the steps of:

providing a catalyst which promotes the afterburning of carbon monoxide; and

delivering said catalyst to the space above the surface of an iron bath.

4,511,398
PROCESS FOR PURIFYING ALUMINUM WITH SODIUM

Tibor Kugler, Thayngen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 13, 1983, Ser. No. 513,472

Claims priority, application Switzerland, Jul. 23, 1982, 4510/82

Int. Cl.³ C22B *21/06*

U.S. Cl. 75—63 **14 Claims**

1. A process for purifying aluminum contaminated with an element selected from the group consisting of group II b, group III a, group IV a and group V a of the periodic table and

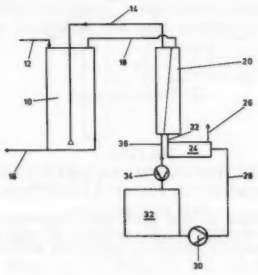
mixtures thereof by liquid extraction in a separating column comprising:

providing a source of contaminated aluminum, a source of sodium, a heat exchanger and a separating column;

feeding a mass of said contaminated aluminum to said separating column;

feeding in countercurrent flow to said contaminated aluminum a quantity of sodium equal to at least five times the mass of the contaminating element so as to produce a purified aluminum product having a small residual amount of said contaminating element and a sodium content of not more than 500 ppm and a sodium product having a small concentration of said contaminating element; and

removing said sodium product from said separating column and feeding said sodium product to said heat exchanger.



4,511,399

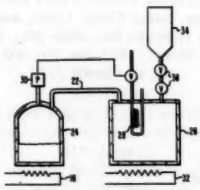
CONTROL METHOD FOR LARGE SCALE BATCH REDUCTION OF ZIRCONIUM TETRACHLORIDE

Young J. Kwon, Fruit Heights, Utah, and Harmon A. Evans, Moses Lake, Wash., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 4, 1983, Ser. No. 539,026

Int. Cl.³ C22B *25/00*

U.S. Cl. 75—84.5 **10 Claims**



1. A control method for large scale batch zirconium reduction, said method comprising:

(a) feeding solid zirconium tetrachloride into a sublimer at least periodically;

(b) heating said sublimer to vaporize said zirconium tetrachloride;

(c) feeding said vaporized zirconium tetrachloride from said sublimer to a reduction vessel;

(d) taking measurements indicative of the feed from said sublimer to said reduction vessel; and

(e) controlling the temperature of a condenser located in conjunction with said sublimer, whereby large batches of zirconium tetrachloride can be economically reduced to high quality zirconium metal.

4,511,400

PRODUCTION OF TOOL STEELS USING CHEMICALLY PREPARED V_2O_3 AS A VANADIUM ADDITIVE

Gloria M. Faulring, Niagara Falls, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 12, 1984, Ser. No. 588,412

Int. Cl.³ C22C *33/08*

U.S. Cl. 75—129 **12 Claims**

1. A process for producing tool steel which comprises:

(a) forming a molten steel having a carbon content above about 0.35 weight percent and containing silicon in an amount of from about 0.15 to about 3.0 weight percent, and a slag covering the molten steel, the slag containing CaO and SiO_2 in proportion such that the weight ratio of CaO to SiO_2 is equal to or greater than unity; and

(b) adding to the molten steel a vanadium additive consisting essentially of finely divided chemically prepared, substantially pure V_2O_3 in at least an amount which will react stoichiometrically with said carbon and silicon to produce from about 0.4 to about 5.0 weight percent vanadium in the molten steel.

4,511,401

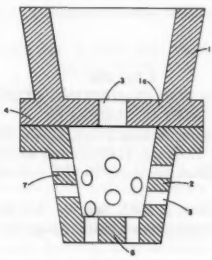
PROCESS FOR THE TREATMENT OF MOLTEN METAL

Geoffrey Mannion, Horsham, and Patrick V. Palmer, Hove, both of England, assignors to The International Meehanite Metal Company Limited, Surrey, England

Division of Ser. No. 92,676, Nov. 9, 1979, Pat. No. 4,312,668. This application Oct. 19, 1981, Ser. No. 312,860

Int. Cl.³ C22C *33/08*

U.S. Cl. 75—130 R **2 Claims**



1. A process for the treatment of molten metal by introduction of a reactive additive which comprises placing the reactive additive in a solid form in an additive container having a cover, a base, and peripheral walls, with a plurality of holes in at least one of the base and peripheral walls, passing molten metal to be treated via a pouring bush into the additive container wherein the metal contacts the additive in the solid form and reacts with the additive, allowing the metal containing the additive to flow through the holes in the additive container into a pouring ladle arranged beneath the additive container, and restricting contact of the molten metal being treated with the atmosphere.

4,511,402

SINTERED SILICON NITRIDE PRODUCTS AND PROCESSES FOR FABRICATION THEREOF

Kazunori Miura; Yoshinori Hattori, and Yasushi Matsuo, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Japan

Continuation of Ser. No. 428,506, Sep. 29, 1982, abandoned. This application Aug. 14, 1984, Ser. No. 640,541

Claims priority, application Japan, Sep. 30, 1981, 56-155452

Int. Cl.³ C22C *29/00*

U.S. Cl. 75—233 **14 Claims**

1. A sintered silicon nitride product formed by sintering a mixture consisting essentially of from 60 to 98.9% by weight of

silicon nitride, from 0.1 to 15% by weight of one or more chromium components selected from metal chromium, chromium oxide, and chromium nitride, and from 1 to 25% by weight of one or more oxides selected from oxides of rare earth elements, scandium oxide, yttrium oxide, aluminum oxide, zirconium oxide and silicon dioxide.

4,511,403

IMMERSION TIN COMPOSITION AND PROCESS FOR USING

Alfred P. Orio, Westford; Leonard R. Levy, Framingham, and Michael Gulla, Sherborn, all of Mass., assignors to Shipley Company Inc., Newton, Mass.

Continuation of Ser. No. 005,667, Jan. 22, 1979, abandoned, which is a continuation of Ser. No. 824,162, Aug. 12, 1977, abandoned. This application Jan. 16, 1980, Ser. No. 112,781

Int. Cl.³ C23C *3/02*

U.S. Cl. 106—1.22 **8 Claims**

1. In an immersion plating solution for tin that plates over a base metal by displacement, said solution containing stannous ions in an amount of at least 0.05 moles per liter, thiourea in an amount such that the mole ratio of thiourea to stannous tin is at least 10:1, and a mineral acid in an amount sufficient to reduce the solution pH to below 1, the improvement comprising an aromatic mononuclear sulfonic acid in solution in an amount sufficient to prevent the formation of a loosely adherent, discolored immersion tin deposit.

4,511,404

COMPOSITIONS FOR INHIBITING CORROSION OF METAL SURFACES

Cyril F. Drake, Harlow; Ronald Jones, Leeds; Paul F. Bateson, Duxford; Ronald J. Grant, Harlow, and Martin E. Burrage, Ilkley, all of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Nov. 2, 1983, Ser. No. 548,206

Claims priority, application United Kingdom, Nov. 2, 1982, 8231658

Int. Cl.³ C09D *5/08*

U.S. Cl. 106—14.12 **4 Claims**

1. In a corrosion inhibiting paint formulation including at least one metal polyphosphate corrosion inhibiting pigment dispersed in a vehicle containing a resin binder, the improvement comprising, as said pigment, a crystalline metal polyphosphate selected from the group consisting of pentastrontium tripolyphosphate and dizinc-monosodium tripolyphosphate.

4,511,405

ANTIFOULANTS FOR THERMAL CRACKING PROCESSES

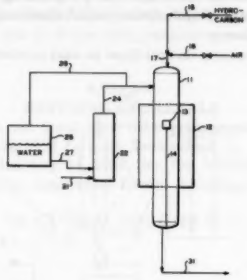
Larry E. Reed; Randall A. Porter; Floyd E. Farha, Jr., and Jack P. Guillory, all of c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Division of Ser. No. 424,889, Sep. 30, 1982, , which is a continuation-in-part of Ser. No. 348,614, Feb. 12, 1982, abandoned. This application May 27, 1983, Ser. No. 499,077

Int. Cl.³ C09D *5/14*

U.S. Cl. 106—15.05 **6 Claims**

1. "An antifoulant composition comprising tin, antimony and germanium". wherein the concentration of antimony in said antifoulant composition is in the range of about 10 mole percent to about 65 mole percent and wherein the concentration of germanium in said antifoulant composition is in the range of about 10 mole percent to about 65 mole percent.



4,511,406

DECORATIVE NONCOMBUSTIBLE COATINGS AND METHODS OF MAKING THE SAME

Charles H. Miller, North Shore, Calif., assignor to The Pathfinders Group, Newport Beach, Calif.

Filed May 10, 1983, Ser. No. 493,157

Int. Cl.³ C09D *5/14*

U.S. Cl. 106—18.14 **9 Claims**

1. A decorative noncombustible coating composition for furnishings and building fixtures having a surface tension of at least about 60 but not in excess of 80 dynes/cm and comprising, in aqueous medium, by weight:

at least about 25 parts but not in excess of about 60 parts of monoaluminum phosphate;

at least about 35 parts but not in excess of about 40 parts of an inert noncombustible coloring material;

at least about 1 part but not in excess of about 3 parts of phosphoric acid; and

a surfactant solution consisting of a mixture of nonyl phenol and alcohol.

4,511,407

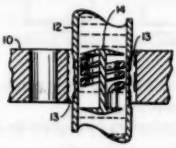
METHOD OF CLEANING CORRODED METAL ARTICLES BY INDUCTION HEATING

David A. Steininger, Santa Clara, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 1, 1982, Ser. No. 438,017

Int. Cl.³ B08B *3/10*

U.S. Cl. 134—1 **7 Claims**



1. A method for removing iron oxide corrosion from a metallic tube and tube support assembly comprising the steps of

(a) contacting said tube support assembly and exterior of said tube with a substantial volume of fluid cleaning agent at a temperature lower than a predetermined temperature range, said predetermined temperature range being that range in which said agent chemically removes said corrosion,

(b) introducing an induction heating means into the interior of said tube at a location adjacent to said corrosion;

(c) locally heating said tube by said induction heating means for a period sufficient to raise the temperature of said cleaning agent in the vicinity of said heating means to a temperature within said predetermined temperature range to remove said corrosion, while adjacent metallic surfaces of said tube and tube support assembly are substantially maintained below said predetermined temperature range by heat dissipation into said volume of fluid cleaning agent.

4,511,408

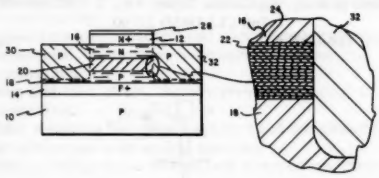
SEMICONDUCTOR DEVICE FABRICATION WITH DISORDERING ELEMENTS INTRODUCED INTO ACTIVE REGION

Nick Holonyak, Jr., Urbana, Ill., assignor to The Board of Trustees of The University of Illinois, Urbana, Ill.

Filed Apr. 22, 1982, Ser. No. 370,756

Int. Cl.³ H01L *21/263, 33/10*

U.S. Cl. 148—1.5 **66 Claims**



1. A method for converting a multilayer semiconductor structure, which comprises first active semiconductor regions interposed between second semiconductor barrier layers, into a disordered alloy of both said first and second semiconductors, said alloy exhibiting a higher energy gap than said first active semiconductor region; the method comprising introducing a disordering element into said multilayer structure, said disordering element being an element selected from the group consisting of silicon and krypton.

4,511,409

PROCESS FOR IMPROVING BOTH FATIGUE STRENGTH AND TOUGHNESS OF HIGH-STRENGTH AL ALLOYS

Daniel Ferton, Grenoble, and Robert Mace, Issoire, both of France, assignors to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

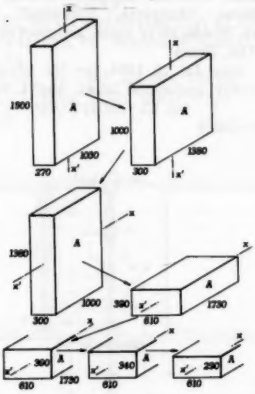
Filed Jul. 1, 1983, Ser. No. 510,200

Claims priority, application France, Jul. 2, 1982, 82 11963

Int. Cl.³ C22F *1/04*

U.S. Cl. 148—2 **7 Claims**

1. A method of improving both fatigue strength and toughness of high-strength Al alloys, comprising casting the high strength Al alloy product along an axis XX'; hot upsetting along the axis XX', with an upsetting ratio (initial length/final length along axis XX') of >1.4; hot drawing along the axis XX', with a rate of working (initial cross section/final cross section) considered perpendicularly to the axis XX' of >1.5; hot compressing along an axis perpendicular to the axis XX', with a rate of reduction (initial cross section-final cross section-/initial cross section) of $>15\%$; and hot deforming in the direction of the XX' axis, wherein the ratio of the thickness of a product (H) to the length of the contact of the product with



a tool (a) as measured in the long direction, is less than or equal to 1.

4,511,410

COPPER-TIN ALLOYS HAVING IMPROVED WEAR PROPERTIES

Eugene Shapiro, Hamden, and Frank N. Mandigo, Northford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 2, 1984, Ser. No. 595,763

Int. Cl.³ C22F *1/08*

U.S. Cl. 148—13.2 **12 Claims**

1. A process for improving the wear performance of a copper-tin alloy, said process comprising:

providing material formed from an alloy consisting essentially of about 2% to about 11% tin, about 0.03% to about 0.75% phosphorous and the balance essentially copper; and

forming a lubricating type film on at least one surface of said material, said forming step comprising subjecting said material to a heat treatment at a temperature in the range of about 400° C. to about 650° C. in an atmosphere having a dew point in the range of about −75° C. to about +95° C. and an oxygen level less than about 300 ppm.

4,511,411

METHOD OF FORMING A HARD SURFACE LAYER ON A METAL COMPONENT

Paul Brunner, Münchenbuchsee, and Beat Hofer, Derendingen, both of Switzerland, assignors to Vereinigte Drahtwerke AG, Biel, Switzerland

Filed Sep. 2, 1983, Ser. No. 528,954

Claims priority, application Switzerland, Sep. 7, 1982, 5313/82

Int. Cl.³ B22F *3/24*

U.S. Cl. 148—20.3 **3 Claims**

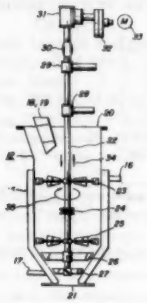
1. A method of forming a nitride layer in the surface- and subsurface-zone of a component made of elements selected from the group consisting of Ti, Zr, Hf, Si, V, Nb, Ta, Cr, Mo, W and alloys thereof, comprising the steps of exposing the chemically untreated component in an autoclave with an atmosphere of nitrogen gas to an isostatic pressure of at least 100 bar and a temperature of at least 200° C. for at least one hour, and thereafter slowly reducing the pressure and the heat in the autoclave steadily.

4,511,412

METHOD OF PRODUCING A WATER-IN-OIL EMULSION EXPOSIVE

Shigeru Kakino; Katsuhide Hattori; Yoshiaki Fukatsu, all of Chita; Hideo Moriyama, Tokoname, and Hidekazu Sakakibara, Handa, all of Japan, assignors to Nippon Oil and Fats Co. Ltd., Japan

Filed Jul. 20, 1984, Ser. No. 632,869
Claims priority, application Japan, Aug. 1, 1983, 58-140923
Int. Cl.³ D03D *23/00*
U.S. Cl. 149—109.6 **1 Claim**



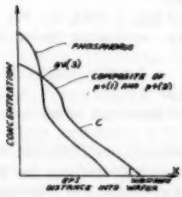
1. In a method of producing water-in-oil emulsion explosive, comprising a step for conditioning an aqueous solution of inorganic oxidizer, a step for conditioning an oil, an emulsifier, or a mixture of oil and emulsifier, a step for mixing the aqueous solution of inorganic oxidizer with the oil and the emulsifier, a step for emulsifying the resulting mixture to form a water-in-oil emulsion, a step for kneading the resulting water-in-oil emulsion together with hollow microspheres, and a step for packing the resulting water-in-oil emulsion explosive, the improvement comprising said kneading step being a kneading step, wherein agitating blades fitted to an agitating shaft in a kneader are subjected to up and down movements in the axial directions of the agitating shaft and concurrently to a rotary motion together with the agitating shaft to knead the water-in-oil emulsion together with hollow microspheres, and the resulting kneaded mixture is exhausted from the bottom portion of the kneader or taken out from the upper portion thereof.

4,511,413

PROCESS FOR FORMING AN IC WAFER WITH BURIED ZENER DIODES

Ralph C. Tuttle, Derry, N.H., and Richard S. Payne, Andover, Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Filed Oct. 5, 1983, Ser. No. 539,127
Int. Cl.³ H01L *21/22*
U.S. Cl. 148—187 **5 Claims**



1. The method of making an IC wafer with a buried Zener diode comprising the steps of:

making a first p+ diffusion into said wafer;

driving said first diffusion in;

making a second p+ diffusion into said wafer over said first diffusion;

driving said first and second diffusions into said wafer to desired depths;

making a third p+ diffusion into said wafer over the first and second diffusions, said third diffusion being shallower than said first and second diffusions and extending out laterally beyond opposite edges thereof; and

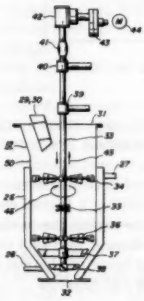
making an n+ diffusion in the central region of said p+ diffusions to form a sub-surface breakdown junction with the p-doped material, said n+ diffusion being shallower than said third p+ diffusion.

4,511,414

METHOD OF PRODUCING A WATER-IN-OIL EMULSION EXPLOSIVE

Fumio Matsui, Handa; Shin Aono, Chita; Hiroshi Sakai, Chita; Katsuhide Hattori, Chita, and Shigeru Kakino, Chita, all of Japan, assignors to Nippon Oil and Fats Co. Ltd., Japan

Filed Jul. 20, 1984, Ser. No. 632,870
Claims priority, application Japan, Aug. 1, 1983, 58-140924
Int. Cl.³ D03D *23/00*
U.S. Cl. 149—109.6 **1 Claim**



1. A method of producing water-in-oil emulsion explosive, comprising mixing an aqueous solution of inorganic oxidizer with a premixture of oil and emulsifier, emulsifying the mixture into a water-in-oil emulsion through the following emulsifying step (a), and then kneading the resulting water-in-oil emulsion together with hollow microspheres in the following kneading step (b):

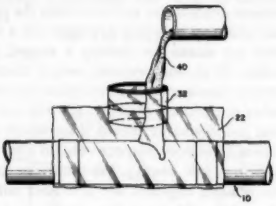
(a) said emulsifying step being an emulsifying step, wherein the above described mixture is fed into an emulsifying machine on its disc arranged in the machine and having projections; the mixture is flowed towards the inner wall of the emulsifying machine, while rotating the disc and imposing a shear force to the mixture by the projections arranged on the disc; the emulsified mixture is flowed down from the outer peripheral portion of the disc into a room formed under the disc; the emulsified mixture is further mixed in the room and is extruded therefrom by means of an extruding blade arranged in the room to produce a water-in-oil emulsion; and

(b) said kneading step being a kneading step, wherein the above obtained water-in-oil emulsion is kneaded together with hollow microspheres by means of agitating blades which carry out concurrently rotary motion and up and down movements.

4,511,415
METHOD OF SEALING AN ELECTRICAL CABLE

Zoltan B. Dienes, Annandale, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Feb. 28, 1983, Ser. No. 470,835
Int. Cl.³ H01B 13/10
U.S. Cl. 156—48 13 Claims

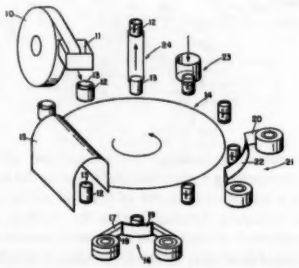


1. A method of sealing an exposed area of an electrical cable comprising the steps of:
forming an enclosure around said exposed area;
sealably attaching said enclosure to said cable adjacent said exposed area;
providing an access opening in said enclosure;
interposing selectively closable flexible inlet means into said access opening;
filling said enclosure through said inlet means with an encapsulant, said encapsulant substantially surrounding said exposed area;
closing said inlet means, thereby preventing escape of said encapsulant;
sealably wrapping said filled enclosure and said closed flexible inlet means with sealing tape; and
placing a sealing sleeve around said wrapped enclosure.

4,511,416
METHOD FOR MAKING DECORATED BATTERY CASINGS

Kenneth M. Karpiloff, New Rochelle, N.Y., assignor to Duracell Inc., Bethel, Conn.

Continuation-in-part of Ser. No. 328,566, Dec. 8, 1981, Pat. No. 4,436,777. This application Dec. 21, 1983, Ser. No. 564,068
Int. Cl.³ B32B 31/12
U.S. Cl. 156—69 5 Claims

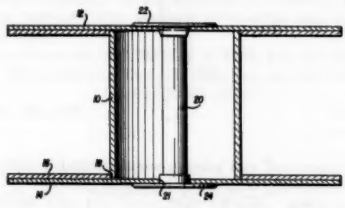


1. A method for making a metallic decorated battery casing from a tubular plastic enclosure member characterized in that said method comprises the steps of placing said enclosure member on a support member, decorating the outer surface of said enclosure member while on said support member by hot stamping a metallic foil thereon, covering said metallic foil decoration with a transparent protective film coating, removing said decorated enclosure member from said support member, and fixedly enclosing a battery therewithin by placing said battery in said decorated tube and heat crimping at least one end of said tubular enclosure member.

4,511,417
CABLE REEL WITH REINFORCING FLANGES

Carl F. Yealy, New Oxford, Pa., assignor to Merline Industries, Inc., Hanover, Pa.

Filed Aug. 31, 1983, Ser. No. 528,166
Int. Cl.³ B29C 27/08; B65H 75/14
U.S. Cl. 156—73.5 1 Claim



1. A method of assembling a reel for storage of rope or cable, said reel having a hollow central core, a pair of end plates and a cylindrical reinforcing member of plastics material, with a pair of flanges of plastics material secured to said cylindrical member and bearing on the outer surfaces of the end plates, said method comprising:
securing a first flange to one end of a cylindrical member;
assembling a pair of end plates, each having a center opening, to a central hollow core member to form a reel;
passing the free end of said cylindrical member through the center openings of said end plates and said hollow core;
placing a second flange with a hole having an interference fit on the free end of said cylindrical member;
spin-welding the second flange to the cylindrical member by pressing the second flange onto the cylindrical member and causing relative rotation between said interference fit hole of the second flange and the cylindrical member so that heat generated by said rotation causes the plastics material of the second flange and the cylindrical member to fuse together.

4,511,418
METHOD OF MAKING A BOTTLE OF SATURATED POLYESTER RESIN

Takami Tsukada, Chiba; Masao Akutsu, and Tadao Saito, both of Tokyo, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 458,352, Jan. 17, 1983, abandoned, which is a division of Ser. No. 245,570, Mar. 20, 1981, abandoned, which is a division of Ser. No. 074,881, Sep. 12, 1979, Pat. No. 9,276,986. This application Oct. 11, 1983, Ser. No. 540,696
Int. Cl.³ B29C 17/07, 27/18; B29D 9/04
U.S. Cl. 156—245 4 Claims

1. A method of making a bottle of saturated polyester resin from an injection molded parison by biaxial orientation, comprising:
forming a parison of saturated polyester resin by injection molding, said parison having a neck portion, a trunk portion extending downwardly from the lower end of said neck portion, and a closed bottom portion;
preparing a piece of saturated polyester resin having an annular portion surrounding the lower end of said neck portion of said parison, and two opposed strip-shaped portions extending downwardly from said annular portion and conforming with the diametrically opposed sides of the trunk portion of said parison;
welding said piece on an outer face of said parison;

placing said welded piece and said parison in a mold having a recess for receiving said welded piece and heating said piece and said parison to a biaxially orientable temperature; and

blow-molding said piece and said parison into contact with the mold such that said piece is received in said recess and

said piece and said parison are elongated longitudinally simultaneously with the

blow-molding, whereby said piece and said parison are shaped into a bottle of saturated polyester resin having biaxially oriented projections which extend vertically on the diametrically opposed side walls of said bottle and reinforce the same.

4,511,419

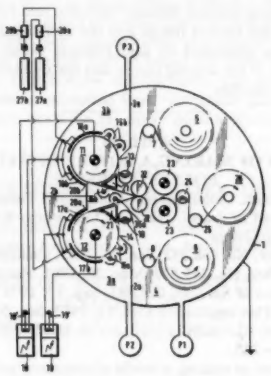
METHOD AND DEVICE FOR LAMINATING FOILS

Heinz Kuhlmann, Wiehl, and Eckhard Prinz, Hamburg, both of Fed. Rep. of Germany, assignors to Firma Erwin Kampf GmbH & Co. and Firma Softal GmbH, both of, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 371,281, Apr. 23, 1982, abandoned. This application Nov. 10, 1983, Ser. No. 550,509

Int. Cl.[3] **B29C** *19/02*

U.S. Cl. 156—272.6 **32 Claims**



1. A method of laminating at least two foils such as plastic foils, metal foils and ribbons, paper, or fabric, the foils being treated with an electrical gas discharge, comprising the steps of: (a) passing a first foil into a first treatment chamber having a first pressure; (b) passing a second foil into a second treatment chamber having a second pressure, the second treatment chamber being separate from the first treatment chamber; (c) treating the first and second foils with a low energy plasma gas discharge in vacuo in their respective treatment chambers such that the surfaces to be bonded together are activated with an energy density of 10 to 10^4 mWs/cm^2; (d) passing the foils into a laminating chamber having a third pressure greater than the first or second pressures, the laminating chamber being separate from the first and second treatment chambers; (e) bringing the foils into contact; and (f) bonding the foils together under pressure and heat.

22. Apparatus for laminating at least two foils such as plastic foils, metal foils and ribbons, paper or fabric, the foils being treated with an electrical gas discharge comprising; (a) a first treatment chamber; (b) means for passing a first foil into the first treatment chamber; (c) first pressure means connected to the first treatment chamber so as to maintain the interior of the first treatment chamber at a first pressure; (d) a second treatment chamber; (e) means for passing a second foil into the second chamber; (f) second pressure means connected to the second treatment chamber so as to maintain the interior of the second chamber at a second pressure; (g) first and second low energy plasma gas discharge means disposed in the first and second treatment chambers, respectively, to treat the first and second foils with a low energy gas discharge such that the surfaces to be bonded together are activated with an energy density of 10 to 10^4 mWs/cm^2; (h) a laminating chamber; (i) means to pass the foils into the laminating chamber; (j) third pressure means connected to the laminating chamber so as to maintain the interior of the laminating chamber at a third pressure; and, (k) bonding means disposed in the laminating chamber to bring the foils into contact with each other under heat and pressure such that they are bonded together.

4,511,420

CONTINUOUS ROD MANUFACTURE

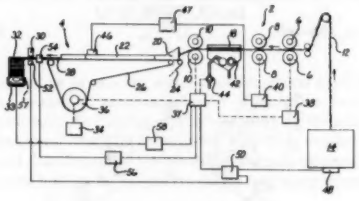
Hugh M. Arthur, Bucks, England, assignor to Molins, Ltd., London, England

Filed Dec. 8, 1981, Ser. No. 328,716

Claims priority, application United Kingdom, Dec. 16, 1980, 8040239

Int. Cl.[3] **A24D** *3/02*

U.S. Cl. 156—356 **27 Claims**



1. Apparatus for making continuous rod of the tobacco industry, comprising a garniture for forming the rod, means for supplying a major constituent of the rod along a path to the garniture including feeding means for feeding at least said major constituent of the rod on said path towards the garniture at a controlled feed rate, means for feeding a secondary constituent of the rod towards said major constituent at a position upstream of said feeding means, means for producing signals indicative of the consumption rate of at least the major constituent, said signal producing means including a detector for detecting the consumption rate of said major constituent upstream of said position, and means for varying the relative feed rates of the major and secondary constituents in response to the signals produced by said signal producing means, including means for changing the feed rate of said feeding means for the major constituent.

4,511,421
COMPONENT-INSERTION TABLE FOR MANUALLY EQUIPPING CIRCUIT CARRIERS

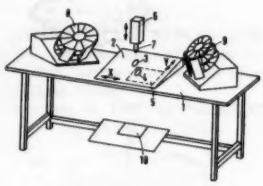
Volker Küehn, Pforzheim; Werner Rothfuss, Korntal-Munchingen, and Richard Widmaier, Kornwestheim, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 3, 1984, Ser. No. 576,598

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1983, 3303951

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—356 **8 Claims**



1. A component-insertion table for manually equipping circuit carriers with surface mountable components comprising:

a take up device for a circuit carrier;

a programmable adhesive dosing feeder;

a programmable component supply device;

an insertion table cover having a window at a central insertion position;

said take up device together with a circuit carrier being movable coordinately below said cover to a central position at which said feeder automatically applies adhesive;

said take up device together with said circuit carrier being movable coordinately below said cover to said central insertion position at which individual component insertion locations on said circuit carrier are accessible from above in a programmed order of succession.

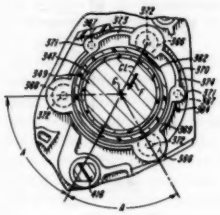
4,511,422
HAND-HELD LABELER

Paul H. Hamisch, Jr., Franklin, and John D. Mistyurik, Tipp City, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Feb. 28, 1984, Ser. No. 582,336

Int. Cl.³ B65C *11/02*

U.S. Cl. 156—384 **3 Claims**



1. A hand-held labeler adapted to print and apply pressure sensitive labels releasably secured to a carrier web, comprising a housing having a handle, means on the housing for supporting a label roll of pressure sensitive labels, means for printing on labels, means for delaminating printed labels, means for applying printed labels, means for advancing the carrier web, means defining a path for guiding the web from the label roll, to the printing means, to the delaminating means, and to the web advancing means, wherein the web advancing means includes a rotatably mounted feed wheel and an electric motor for driving the feed wheel, wherein the feed wheel includes an annular portion having an outer periphery, three peripherally spaced rolling-contact members in supported contact with the annular portion, two of the rolling contact members being firmly mounted in force opposition to the force exerted by the feed wheel during advance of the carrier web, and the third rolling-contact member being yieldably mounted to exert force against the annular portion.

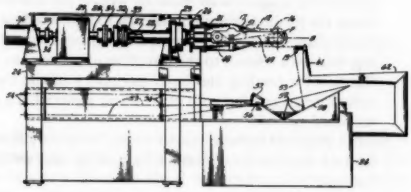
4,511,423
APPARATUS FOR WINDING FIBER REINFORCED PIPE FITTINGS

Gerald M. Magarian, Cypress, and Ralph S. Friedrich, Hermosa Beach, both of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Division of Ser. No. 300,292, Sep. 8, 1981, Pat. No. 4,437,816. This application Dec. 12, 1983, Ser. No. 560,107

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—425 **33 Claims**



1. Apparatus for winding a fiber reinforced article comprising:

means for holding and rotating a mandrel for the article;

a delivery ring for delivering at least one fiber roving to the mandrel in response to mandrel rotation:

means for translating the delivery ring in any direction in an X-Y plane while remaining fixed in a Z direction normal to the X-Y plane; and

means for alternately rotating the mandrel around an A axis parallel to the X direction and a B axis parallel to the Y direction.

4,511,424
APPARATUS FOR PRODUCING SHEET MOLDING COMPOUND

Fumio Usui, 441 Shimoasao, Asao-ku, Kawasaki-shi, Kanagawa, 215, Japan

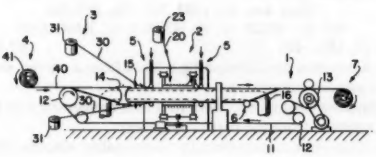
PCT No. PCT/JP82/00204, § 371 Date Dec. 29, 1982, § 102(e) Date Dec. 29, 1982, PCT Pub. No. WO82/04219, PCT Pub. Date Dec. 9, 1982

PCT Filed May 28, 1982, Ser. No. 456,089

Claims priority, application Japan, May 30, 1981, 56-83119

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—426 **5 Claims**



1. An apparatus for producing a sheet molding compound, comprising:

a belt circulator for circulating a flat belt while curving said flat belt in a cylindrical form along a predetermined path and guiding it;

a carrier film roll disposed adjacent said belt circulator for supplying a carrier film to said cylindrically formed portion;

a warp material bobbin disposed adjacent said belt circulator and having a linear warp material wound therearound and being for supplying the warp material to said cylindrically formed portion;

a winding disk supported coaxially and relatively movably along said cylindrically formed portion of said flat belt and having at least one guide hole therein;

a driving mechanism connected to said winding disk for rotating said winding disk alternately in opposite directions at a predetermined period and at a predetermined speed;

a winding drum disposed upstream of and adjacent to said winding disk with respect to the direction of movement of said flat belt and supported coaxially and relatively movably along said cylindrically formed portion;

a weft material bobbin disposed adjacent said belt circulator and having a linear weft material wound therearound and being for feeding said weft material to said winding drum;

a binder disposed downstream of and adjacent to said winding disk with respect to the direction of movement of said flat belt for binding the outer periphery of the cylindrically formed portion with other linear material at a predetermined period;

a cutter disposed at the downstream end of said cylindrically formed portion for continuously cutting said weft material; and

an improved synthetic resin feeder disposed upstream or downstream of said winding disk for supplying synthetic resin to the warp or weft material and comprising a hollow annular nozzle, means for supplying synthetic resin into said nozzle, said nozzle having an annular nozzle opening facing along the cylindrically formed portion and having an upstream edge with substantially the same inside diameter as the outside diameter of the material wound on the cylindrically formed portion for being in contact with the outer peripheral surface of the cylindrically formed portion during use, and having a downstream edge with an inside diameter slightly larger than the outside diameter of the cylindrically formed portion for being spaced slightly from the surface of the cylindrically formed portion and curved in the downstream direction for supplying a layer of resin from the nozzle onto the cylindrically formed portion.

4,511,425

HEATED PAD DECORATOR

Mary G. Boyd, Framingham; Donald R. Smith, Hingham, both of Mass.; Peter F. Imondi, Providence, R.I.; Norman A. Hiatt, Framingham, Mass.; Fritz E. Bauer, Shrewsbury, Mass.; John M. Anemaet, Millis, Mass., and Alfred K. MacKenzie, Wayland, Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Jun. 13, 1983, Ser. No. 503,486

Int. Cl.³ B32B *31/00*; B30B *5/02*; B44C *3/00*

U.S. Cl. 156—493 **22 Claims**

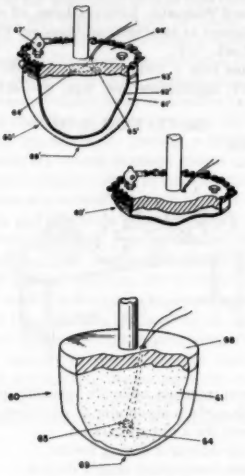
1. Apparatus for transferring a label from a carrier member to an article, comprising:

means for heating the label to a first temperature to permit removal from the carrier member;

an elastomeric, substantially deformable silicone transfer pad, comprising a polysiloxane resin, said pad having a convex curvature with a well-defined apex;

a flexible heating element embedded within the silicone material of said transfer pad, which heats the pad's surface by conduction to a second temperature lower than said first temperature; and

means for pressing the silicone transfer pad against said label to adhere the label thereto and remove the label from the carrier member, and for thereafter pressing the silicone



transfer pad and label against the article to bond the label to the article.

4,511,426

HOT GAS SEALING DEVICE

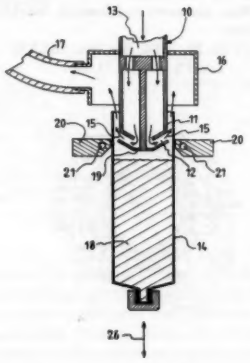
Hans Linnér, Kalmar, Sweden, assignor to Norden Packaging Machinery AB, Kalmar, Sweden

Filed Dec. 30, 1983, Ser. No. 567,318

Claims priority, application Sweden, Jan. 20, 1983, 8300277

Int. Cl.³ B32B *31/26*

U.S. Cl. 156—497 **5 Claims**



1. A device for hot gas welding, preferably hot air sealing, comprising:

a nozzle for activating a sealing area around an opening at the inside of a hollow body, for instance a tube,

a slot device in said nozzle arranged for directing a flow of gas out through the opening and activating said sealing area when the nozzle is in the operative position thereof,

means at the opening of the hollow body for recirculation of the flow of gas,

means for cooling the hollow body externally around the

sealing area comprising a loop containing a cooling medium, and

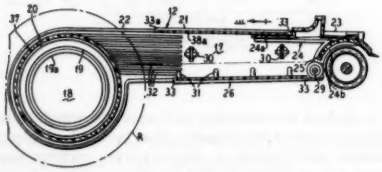
a gas guiding element of a heat insulating material, acting as a heat shield for the goods within the hollow body.

4,511,427

MASKING TAPE APPLICATOR

Rudy R. Karliner, Minnetonka, and Gerald E. Peterson, St. Paul, both of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Aug. 15, 1983, Ser. No. 522,972
Int. Cl.³ B32B *35/00*
U.S. Cl. 156—523 **12 Claims**



1. A hand held tape dispenser and applicator which comprises a hollow housing having a tape roll receiving hub at one end, a hand grasped finger extending from said one end, and a dispensing outlet at the end of the finger, a feed roll rotatably mounting in the housing adjacent the outlet, a press roll rotatably mounted in the housing at the outlet, a trigger slidably mounted in the housing having a cutter head adapted to be projected over the press roll for severing a length of tape, and said feed roll adapted to receive therearound the adhesive face of tape from a roll mounted on the hub to direct a non-adhesive face of the tape under the press roll whereby the tape between the press roll and the surface to be taped will be pulled over the feed roll and applied to the surface as the applicator is advanced over the surface, and whereby the trigger is adapted to be propelled to press the cutter against the tape for severing the applied length of tape, said trigger having a flat slide, said cutter head tilts on said slide, and said housing has tracks receiving the slide and cutter head.

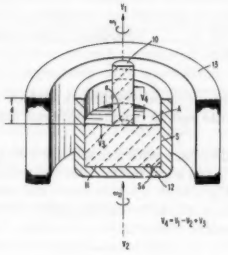
11. A hand held tape dispenser and applicator which comprises a hollow housing having a tape roll receiving hub at one end, a hand grasped finger extending from said one end, and an open front and open bottom dispensing outlet at the end of the finger, a feed roll rotatably mounted in the housing adjacent the outlet, a press roll rotatably mounted in the housing at the outlet and projecting beyond the open front and open bottom of the outlet, and a trigger slidably mounted in the housing having a cutter head movable from a retracted position leaving the press roll exposed to a projected position covering the open front of the dispensing outlet closely adjacent the press roll for severing a dispensed length of tape close to the press roll at the open bottom of the outlet, said feed roll being adapted to receive therearound the adhesive face of tape from a roll mounted on the hub to direct the opposite face of tape onto the press roll whereby the tape between the press roll and the surface to be taped will be pulled over the feed roll and applied to the surface as the applicator is applied over the surface and whereby the length of tape applied to the surface is severed as the press roll is lifted above the surface forcing the cutter head through the tape closely adjacent the press roll.

4,511,428

METHOD OF CONTROLLING OXYGEN CONTENT AND DISTRIBUTION IN GROWN SILICON CRYSTALS

Hitendra Ghosh, Bloomfield Hills, Mich.; Ashok Murgai, Wappingers Falls, and Wolfgang A. Westdorp, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 9, 1982, Ser. No. 396,986
Int. Cl.³ C30B *15/20*
U.S. Cl. 156—601 **11 Claims**



1. In the method of growing silicon crystals by the Czochralski method, wherein a seed crystal is inserted into a bath of silicon in a crucible maintained molten by a heater and slowly withdrawn therefrom to grow a crystal substantially larger than the seed crystal, the improvement in controlling the lift rate of the crucible to achieve axial uniformity in the oxygen concentration in the as-grown crystal comprising;

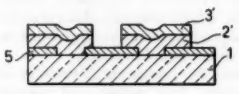
raising the crucible in the heater at a rate which exceeds the rate at which the melt level in the crucible recedes.

4,511,429

PROCESS FOR DRY ETCHING OF ALUMINUM AND ITS ALLOY

Tatsumi Mizutani, Kodaira; Toshihide Ohgata, and Hideo Komatsu, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP82/00116, § 371 Date Dec. 15, 1982, § 102(e) Date Dec. 15, 1982, PCT Pub. No. WO82/03636, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 9, 1982, Ser. No. 453,894
Claims priority, application Japan, Apr. 15, 1981, 56-55548
Int. Cl.³ C23F *1/02;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—643 **12 Claims**

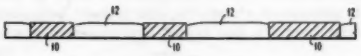


1. Process for dry etching of copper-containing aluminum alloys comprising adding 0.5–10 vol.% of at least one member selected from hydrogen and gaseous hydrogen compounds in a chloride gas-containing dry etching gas in a method for processing an article of said copper-containing aluminum alloys with a glow discharge plasma of said chloride gas-containing gas, and heating the article at 80°–250° C.

4,511,430
CONTROL OF ETCH RATE RATIO OF SiO_2/PHOTORESIST FOR QUARTZ PLANARIZATION ETCH BACK PROCESS

Lee Chen, and Gangadhara S. Mathad, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 30, 1984, Ser. No. 575,118
Int. Cl.[3] **B44C** *1/22;* **C03C** *15/00, 25/06;* **B29C** *17/08*
U.S. Cl. 156—643 **6 Claims**



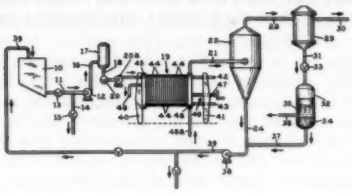
1. A method for uniformly etching a surface which includes both silicon dioxide and an organic polymer material comprising the steps of

contacting said surface with a reactive etching plasma which contains CF_4 and a gas taken from the group consisting of CHF_3 and C_xF_y with $x>1$ to cause the structure formed by said etching step to be substantially planar and have an etch rate ratio of 1.2 ± 0.1.

4,511,431
PROCESS FOR EVAPORATIVE STRIPPING

James G. Moore; James H. Obey, both of Williamsville, and Edward B. Pinkel, Angola, all of N.Y., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jun. 4, 1982, Ser. No. 385,322
Int. Cl.[3] **B01D** *1/00, 1/16, 1/30;* **F28F** *3/08*
U.S. Cl. 159—47.1 **13 Claims**



1. A process for removing volatile components from a liquid material comprising the steps of

(a) heating the liquid material in the absence of a stripping gas,

(b) maintaining the pressure and temperature of the liquid material during the heating step at predetermined levels to prevent any vaporization of the volatile components from occurring during the heating of the liquid material,

(c) after heating the liquid material, continuously passing the liquid material directly through a restrictive orifice forming flow path,

(d) immediately thereafter passing the liquid material directly into a relatively elongated, narrow confined passage having a high ratio of surface area to volume of fluid flow and a predetermined configuration to impart a turbulent flow to the liquid material,

(e) maintaining the pressure and velocity conditions of the liquid material flow within said passage whereby said conditions, relative to such conditions existing during the heating of the liquid material, will cause the majority of the volatile components of the liquid material to, substantially instantaneously vaporize in a flashing action as the liquid material passes from the restrictive orifice forming flow path to said passage,

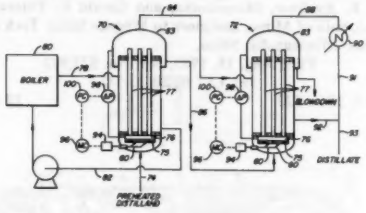
(f) continuing to pass the liquid material and vaporized volatile components as a homogeneous mixture in turbulent flow through said passage whereby the vaporized volatile components continue to flow as a high velocity vapor continuum carrying said liquid material in atomized droplet form and subjecting said liquid droplets to a turbulent stripping action to remove the remaining volatile components therefrom, and

(g) passing the high velocity vapor contiuum-liquid droplet flow into a liquid-vapor separator.

4,511,432
FEED DISTRIBUTION METHOD FOR VERTICAL TUBE EVAPORATION

Hugo H. Sephton, 120 York Ave., Kensington, Calif. 94708

Filed Sep. 7, 1982, Ser. No. 415,088
Int. Cl.[3] **B01D** *1/08, 1/10*
U.S. Cl. 159—47.1 **10 Claims**



1. A method for operating an evaporator which includes a plurality of vertical heat transfer tubes having feed inlets at the lowermost ends thereof, a tube mounting member sealingly connected to said tubes at said lowermost ends, a liquid inlet plenum enclosing the lower ends of the tubes, a distributor plate located within the inlet plenum and having a multiplicity of orifices therethrough, said distributor plate being normally spaced from the inlet ends of the tubes to form a gap with said mounting member defining a manifold which interconnects said inlets to allow cross flow therebetween, and an outlet plenum enclosing the upper ends of the tubes, said method comprising:

feeding a liquid to be evaporated to the inlet plenum so that the liquid flows through the orifices in the distributor plate into the manifold and thereafter into the tubes, and

damping cross flow oscillation between the inlet ends of two or more tubes or tube groups by adjusting said gap to be in the range from 0.01 to 0.2 of the average tube width, to improve heat transfer in said evaporator.

4,511,433
METHOD FOR THE SIMULTANEOUS DELIGNIFICATION OF WOOD AND OTHER LIGNO-CELLULOSIC MATERIALS AND HYDROLYSIS OF THE HEMICELLULOSE COMPONENT THEREOF

Herve Tournier, Valleiry, France; Allan A. Johansson, Meyrin, Switzerland; Jean-Pierre Sachetto, Saint Julien En Genevois, France; Jean-Michel Armanet, Onex, Switzerland; Jean-Pierre Michel, Collonges Sous Salve, and Alain Roman, Bossey, both of France, assignors to Battelle Memorial Institute, Carouge, Switzerland

Continuation of Ser. No. 329,360, Dec. 10, 1981, abandoned, which is a continuation-in-part of Ser. No. 274,350, Jun. 17, 1981, abandoned. This application Jul. 27, 1984, Ser. No. 636,061

Claims priority, application Switzerland, Jun. 20, 1980, 4737/80

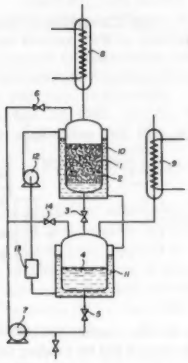
Int. Cl.[3] **C13K** *1/02;* **D21C** *3/02, 3/20, 11/00*
U.S. Cl. 162—16 **16 Claims**

1. A method for simultaneous delignification of wood and other ligno-cellulosic materials and hydrolysis of the hemicellulose component thereof into monomeric sugars and recovering pulp, phenol, lignin and sugars, which comprises:

(a) contacting one part by weight solids of said wood or

other lignocellulosic materials with a liquid of at least 0.5 to 100 parts by weight of a dilute aqueous acid of a pH below 1.5 and having an acid concentration of 0.5 to 6.0% by weight, and 0.4 to 6.0 parts by weight of phenol or other phenolic compounds;

(b) heating the contacting solids, aqueous acid and phenol or other phenolic compounds under ambient pressure or slightly above or below ambient pressure and only at



reflux temperatures of from 90° to 110° C. for ½ to 8 hours to form a delignified and hydrolysed pulp;

(c) filtering and draining the pulp of step (b) without further heating to provide a filtrate and a residual solid of said pulp; and

(d) separating of the filtrate into an organic phase containing said phenol and lignin and an aqueous phase containing said sugars.

4,511,434

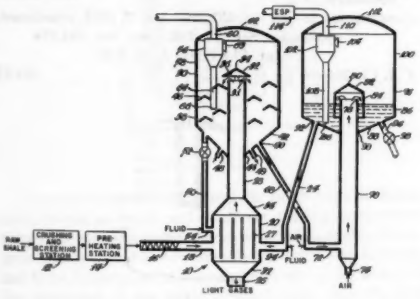
FLUID BED RETORTING SYSTEM

Iacovos Vasalos, Downers Grove, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 293,694, Aug. 17, 1981, Pat. No. 4,404,083. This application Sep. 27, 1982, Ser. No. 423,663

Int. Cl.³ B01J *8/30, 8/32;* **C10B** *49/22*

U.S. Cl. 202—99 **17 Claims**



1. A fluid bed system, comprising:

a generally upright lift pipe;

a first vessel in fluid communication with and located downstream and generally above said lift pipe;

an enlarged mixing chamber in fluid communication with and located upstream and generally below said lift pipe, said enlarged mixing chamber having a maximum transverse cross-sectional area substantially greater than the maximum transverse cross-sectional area of said lift pipe;

lift gas means directly connected to and communicating with said enlarged mixing chamber for injecting a lift gas into said enlarged mixing chamber, said lift gas means including combustion preventing means for preventing air and a sufficient amount of molecular oxygen to support combustion from entering said enlarged mixing chamber to substantially prevent combustion in said enlarged mixing chamber and lift pipe;

first feed means directly connected and extending into said enlarged mixing chamber for feeding a first material into said enlarged mixing chamber;

second feed means comprising combusted solid material feed means spaced separately and apart from said first feed means and directly connected and extending into said enlarged mixing chamber for feeding a second material consisting essentially of substantially combusted solid material into said enlarged mixing chamber;

combustor means spaced separately and laterally away from said enlarged mixing chamber and said lift pipe for substantially combusting carbon residue contained on said material, said combustor means including a combustor lift pipe and a second vessel comprising a combustor vessel in fluid communication with and located downstream and generally above said combustor lift pipe;

combustor feed means directly connecting and extending between said first vessel and said combustor lift pipe for discharging and feeding material containing carbon residue from said first vessel to said combustor lift pipe; and

said second feed means directly connecting and extending between said combustor vessel and said enlarged mixing chamber for feeding said combusted material to said enlarged mixing chamber for use as said second material.

4,511,435

NON-FLOODING DISTILLING COLUMN

Rudy Strohschein, Rte. 1, Box 83, Micanopy, Fla. 32667

Filed Feb. 1, 1982, Ser. No. 344,684

Int. Cl.³ B01D *53/20*

U.S. Cl. 202—158 **5 Claims**

1. Apparatus for separation of volatiles from heavier fractions comprising:

a vertically oriented distillation column having a plurality of chambers, adjacent ones of said chambers separated by orifices forming valve seats; and

a plurality of floating ball vapor valves, each of said valves having a hollow ball portion, a lower surface of said ball portion forming a valve face, said valve face having indentations therein, said ball portion having a downwardly

extending stem portion wherein one of said valves is disposed in each of said orifices with said valve face in contact with said valve seat and said indentations forming liquid flow passages between adjacent ones of said chambers;

whereby said indentations serve to prevent flooding of said chambers.

4,511,436

APPARATUS FOR THE DESALINATION OF SEA WATER

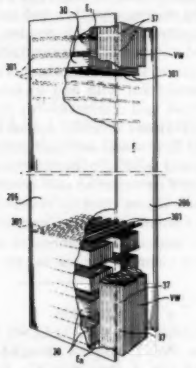
Gamal el Din Nasser, Puchheim, Fed. Rep. of Germany, assignor to D.V.T. Büro für Anwendung Deutscher Verfahrenstechnik H. Morsy, Dusseldorf, Fed. Rep. of Germany

Filed May 20, 1983, Ser. No. 496,713

Claims priority, application Fed. Rep. of Germany, May 24, 1982, 3219387

Int. Cl.³ B01D *1/26, 3/02*

U.S. Cl. 202—174 12 Claims



1. Apparatus for desalinating sea water by a multi-effect evaporation process comprising elements designed, sized and arranged for maximizing efficiency, facilitating removal, of inert gases, maximizing feed distribution and facilitating assembly and maintenance, including a sea water preheater and a falling film evaporator each subdivided into a plurality of sections in accordance with predetermined and selected pressure and temperature stages, each of said sea water preheater and falling film evaporator comprises a plurality of heat exchanger plates with each plate having a pair of oppositely facing sides comprising a first side and a second side and each first and second sides having a first dimension and a second dimension extending perpendicularly of the first dimension, the surfaces of said first and second sides being similarly deformed providing projections on said first and second sides and depressions on the side opposite the projections, said projections-depressions extending in a grid-like arrangement in the direction of the first and second dimensions of said plates with said projections and depressions aligned in rows in the direction of the first and second dimensions, a pair of said plates arranged with the first sides thereof disposed in facing relation with the depressions in the first sides extending in the direction of the first dimension being disposed in opposed alignment and registration and forming tubular ducts extending in the first dimension direction, another said plate placed on each side of said pair of said plates with the second side of the another said plate facing the second side of the adjacent one of said pair of said plates with the projections on said second sides extending in the second dimension direction disposed in opposed alignment, registration and contacting relation for forming therebetween slot-like ducts extending in the direction of the second dimension.

4,511,437

PROCESS FOR THE CONTINUOUS RECTIFICATION OF ALCOHOLIC FERMATES

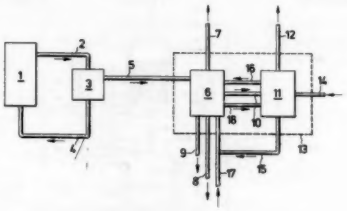
Günter Heck, Wiesbaden; Aladar Lienerth, Kelkheim; Egon Malow, Hochheim am Main; Karl-Heinz Schwarz, Liederbach, and Uwe Faust, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 439,269

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143734

Int. Cl.³ B01D *3/38*

U.S. Cl. 203—19 4 Claims



1. In a process for the continuous rectification of alcoholic fermates which is carried out by feeding said fermates in parallel flow into a plurality of heated distillation columns having successively reduced pressures from an initial column to a last column thereof, each said column having an associated sump, and withdrawing top vapor from the top of each column and using the heat from said top vapor to furnish part of the energy for rectification in the next following one of said columns; the improvement which comprises, maximizing energy usage and avoiding solids deposition from the fermates by, feeding direct steam having a temperature of 130° C. to 160° C. for direct heat exchange to the sump of said initial column; generating direct steam by indirect heat exchange of water with the top vapor withdrawn from the top of said initial column; and feeding the resulting direct steam for direct heat exchange to the sump of the next-lower-pressure column.

4,511,438

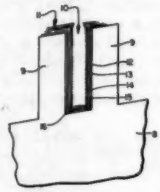
BI-METALLIC ELECTROFORMING TECHNIQUE

Ralph D. DiStefano, Palm Bay, and Nicholas Moldovan, Indian Harbor Beach, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 482,206, Apr. 5, 1983, abandoned. This application Sep. 20, 1983, Ser. No. 534,074

Int. Cl.³ C25D *1/00, 1/02*

U.S. Cl. 204—4 64 Claims



1. A process for forming an article on an electroforming mandrel, said article having a sufficiently uniform wall thickness to provide a final article with adequate strength, comprising the steps of:

(a) electroforming a first layer on said mandrel, said first layer being thicker on first portions of said mandrel than on other portions of said mandrel;

(b) electrolessly depositing a plurality of layers on said first

layer, said plurality of layers having a more uniform thickness than said first layer; and

(c) electroforming a final layer on said plurality of layers.

4,511,439
SOLAR-SELECTIVE LAYERS AND METHOD FOR PRODUCING SAME

Boy Cornils, Dinslaken; Jürgen Weber; Béla Tihanyi, both of Oberhausen, and Werner DeWin, Dinslaken, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft and M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, both of, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,094

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210367

Int. Cl.³ C25D *5/54;* F24J *3/02*

U.S. Cl. 204—37.1 **8 Claims**

1. A method for producing solar-selective layers on a converter for converting solar radiation into thermal energy by means of a metal oxide layer applied to the surface of said converter which includes the steps of depositing a metal layer on the surface of said converter and then oxidizing said layer at a temperature of between 100° C. and 400° C. and a pressure of between 50 and 250 bars.

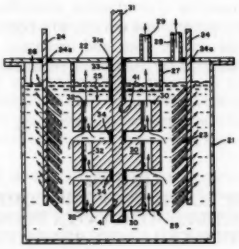
4,511,440
PROCESS FOR THE ELECTROLYTIC PRODUCTION OF FLUORINE AND NOVEL CELL THEREFOR

Alexander M. Saprokhin, Amherst; David J. Friedland, Snyder; Richard M. Baran, Cheektowaga; Jung T. Kim, Williamsville, and Lynn E. McCurry, Hamburg, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 27, 1983, Ser. No. 564,639

Int. Cl.³ C25B *1/02, 1/24, 11/03, 11/12*

U.S. Cl. 204—60 **5 Claims**



1. In a process for the electrolytic production of fluorine in a cell having an anode and a cathode, the improvement which comprises providing the anode with substantially horizontal grooves connected to substantially vertical holes, said grooves and holes forming internal passages directing the flow of fluorine generated at the anode upward, away from the surface, and toward the interior of the anode employing in conjunction therewith a cathode having a louvered structure, generating fluorine gas in the cell, effecting the removal from the surface of the anode of fluorine formed on the surface of the anode by withdrawing said fluorine internally through said passages in the anode and venting hydrogen, which is formed during the generation of fluorine, from the zone between the anode and cathode through said louvered cathode.

4,511,441
METHOD OF OPERATING A LIQUID-GAS ELECTROCHEMICAL CELL

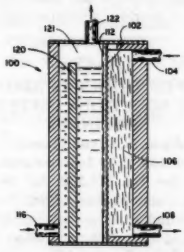
James A. McIntyre, and Robert F. Phillips, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 349,891, Feb. 18, 1982, Pat. No. 4,406,758. This application Aug. 24, 1983, Ser. No. 525,862

The portion of the term of this patent subsequent to Sep. 27, 2000, has been disclaimed.

Int. Cl.³ C25B *1/46, 1/30*

U.S. Cl. 204—98 **13 Claims**



1. A method for electrochemically reacting a liquid with a gas in an electrochemical cell of the type having at least two electrodes separated by a liquid permeable separator; at least one of said electrodes being in physical contact with said separator and being porous and self-draining, said method comprising:

(a) flowing a gas into at least a portion of the pores of the self-draining electrode;

(b) controllably flowing the liquid through said separator and into the self-draining electrode at a rate about equal to the drainage rate of the electrode and in a quantity sufficient to fill only a portion of the electrode pores;

(c) electrochemically reacting the liquid with the gas to form at least one nonvolatile product; and

(d) removing the electrochemical products from said self-draining electrode.

4,511,442
ANODE FOR ELECTROLYTIC PROCESSES

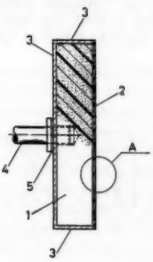
Alberto Pellegri, Luino, Italy, assignor to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Continuation of Ser. No. 395,942, Jul. 7, 1982, abandoned. This application May 15, 1984, Ser. No. 609,536

Claims priority, application Italy, Mar. 26, 1982, 20407 A/82

Int. Cl.³ C25B *1/34, 11/04, 11/12*

U.S. Cl. 204—98 **14 Claims**



1. Dimensionally stable anode for electrochemical reactions characterized in that it comprises an electroconducting body

impermeable to aqueous electrolytes and to gases constituted by a thermoformed mixture of graphite particles and inert thermoplastic resin powders having on at least one side thereof an electrocatalytic layer impermeable to aqueous electrolytes and gases consisting of a mixture of inert resin and particles of an oxide of at least one of the metals belonging to the group of ruthenium, iridium, platinum, palladium, rhodium, manganese, cobalt, lead, iron, tin, and nickel, the inert thermoplastic resin of the electroconducting layer forming a homogeneous matrix through the cross-section of the anode whereby the graphite particles of the electroconducting body and the particles of an oxide of the electrocatalytic layer are each fused in a continuous resin matrix, and wherein said thermoplastic resin is capable of being fused to produce a substantially impervious body.

4,511,443

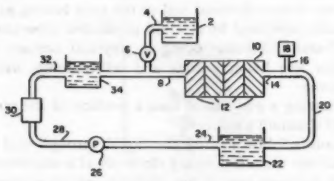
METHOD OF THIOUREA ADDITION TO ELECTROLYTIC SOLUTIONS USEFUL FOR COPPER REFINING

Martin Goffman, Edison, N.J., and Thomas L. Jordan, Amarillo, Tex., assignors to ASARCO Incorporated, New York, N.Y.

Continuation of Ser. No. 514,538, Jul. 19, 1983, Pat. No. 4,474,649, which is a continuation of Ser. No. 390,733, Jul. 21, 1982, abandoned, which is a continuation of Ser. No. 236,965, Feb. 23, 1981, abandoned. This application May 1, 1984, Ser. No. 606,061

Int. Cl.³ C25C *1/12*

U.S. Cl. 204—108 **5 Claims**



1. A copper product prepared in the electrolytic refining of copper by a method comprising:

creating in a suitable container means having inlet and outlet streams a copper refining electrolyte comprising an aqueous solution of sulfuric acid and copper sulfate of effective strength, the solution including small amounts by weight of addition agents, one of which is thiourea;

adding a sufficient amount of thiourea to the inlet stream to maintain the outlet stream concentration of thiourea at a value at least above trace concentrations; and

electrorefining copper in the container means.

4,511,444

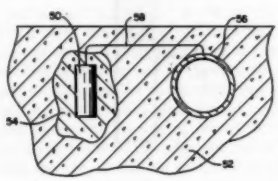
BACKFILL FOR MAGNESIUM ANODES

Alexander J. Dukat, Columbus, Ohio, assignor to Columbia Gas Systems Service Corp., Columbus, Ohio

Filed Sep. 1, 1983, Ser. No. 528,609

Int. Cl.³ C23F *13/00*

U.S. Cl. 204—148 **19 Claims**



1. A backfill composition for use with a magnesium anode comprising on a dry basis from about 65 to about 85% by weight of calcium hydroxide, from about 1 to about 8% by weight of calcium sulfate, from about 10 to about 30% by weight of bentonite clay and from about 0.25% to about 10% by weight of calcium fluoride.

4,511,445

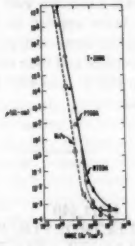
PROCESS OF ENHANCING CONDUCTIVITY OF MATERIAL

Stephen R. Forrest, Chatham; Martin L. Kaplan, Morris Plains; Paul H. Schmidt, Chatham, and Thirumalai N. C. Venkatesan, Bridgewater, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 18, 1982, Ser. No. 389,776

Int. Cl.³ B01J *19/08*; H01L *29/28*

U.S. Cl. 204—158 HE **12 Claims**



1. A method of making an article characterized by irradiating with particles having an atomic weight of at least 1, at least a portion of carbon-containing material having a resistivity greater than 1 ohm-cm prior to said irradiating, thereby essentially permanently reducing the resistivity of the irradiated portion of the material to less than 0.1 ohm-cm, due substantially to the formation of conducting amorphous-type carbon in said irradiated portion and not due to a possible presence of any metal in the article, with said irradiated portion of the material being adapted for use for the conduction of electrons.

4,511,446

CATHODIC ELECTROCOATING COMPOSITION COMPOUNDED WITH LATEX BINDER FOR ENHANCED GLOSS RETENTION

Kirk J. Abbey, Cleveland, and Barbara L. Kunz, Bay Village, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Jul. 14, 1983, Ser. No. 513,619

Int. Cl.³ C25D *13/06, 13/24*

U.S. Cl. 204—181 C **9 Claims**

1. A method of electrocoating an electrically conductive surface serving as a cathode in an electrical circuit comprising said cathode, and anode, and an aqueous electrodepositable composition wherein net unidirectional electric current is passed through said circuit for causing deposition of said composition on said cathode, said method being characterized by using as said composition one that comprises synthetic, cationactive, film-forming, amino-stabilized, emulsion polymerized latex particles having T_g of at least about 20° C.

2. The method of claim 1 wherein the composition is electrodeposited from a bath that is at least about 10° higher than the Tg of said latex.

4,511,447

ELECTRODEPOSITION OF RESINOUS COMPOSITIONS CURABLE THROUGH A TRANSESTERIFICATION CURING MECHANISM

Joseph T. Valko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 288,239, Jul. 29, 1981,. This application Aug. 1, 1984, Ser. No. 636,632

Int. Cl.[3] **C25D** *13/06;* **C08L** *63/02*

U.S. Cl. 204—181 C **10 Claims**

1. A method of coating a conductive substrate serving as a cathode which comprises passing electric current between an anode and a cathode in electrical contact with an aqueous resinous dispersion, which comprises:

(A) a polymeric polyol which contains cationic salt groups,

(B) a crosslinking agent having at least two gamma- and/or delta-hydroxyester groups per molecule, and

(C) a transesterification catalyst.

4,511,448

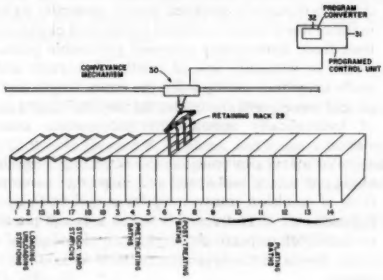
PLATING APPARATUS

Seiitch Tanaka, and Akitoshi Inoue, both of Tokyo, Japan, assignors to Anritsu Electric Company Limited, Tokyo, Japan

Filed May 22, 1981, Ser. No. 266,395

Int. Cl.[3] **C25D** *17/08, 17/28;* **B05C** *3/00*

U.S. Cl. 204—198 **8 Claims**



1. A plating apparatus having a plurality of retaining racks, comprising:

loading-unloading stations for loading an unplated article onto each of said retaining racks and for unloading a plated article from said each of said retaining racks;

treating baths for plating the unplated articles;

a conveyance mechanism for conveying said retaining racks; and

a pluality of stock yard stations for temporarily receiving said retaining racks, said stock yard stations being disposed immediately below a path traversed by the conveyance mechanism and adjacent the loading-unloading stations and treating baths;

in which each of said retaining racks, comprises:

a first electrically conductive member removably disposed so as to horizontally cross uppr portions of said treating baths;

a plurality of second electrically conductive members detachably provided on and electrically connected to said first electrically conductive member and depending from said first electrically conductive member at arbitrary positions therealong, said second electrically conductive members having a plurality of contact portions for urging and supporting, longitudinally of said first electrically conductive member, articles that are to be plated, and for supplying said articles with an electric current;

a shielding frame provided below said first electrically conductive member so as to surround the region in which said second electrically conductive members can move; and

a positioning member for regulating the distance between the second electrically conductive members in such a manner that said articles to be plated are supported between contact members on adjacent ones of said second electrically conductive members;

said articles to be plated being pressured and supported between the contact portions of said adjacent ones of said second electrically conductive members.

4,511,449

CATHODE FOR A FUSED SALT REDUCTION CELL

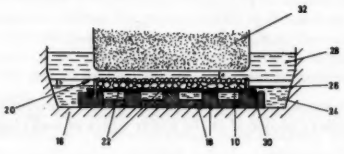
Sandor Molnar, Neuhausen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 9, 1983, Ser. No. 549,921

Claims priority, application Switzerland, Nov. 15, 1982, 6635/82

Int. Cl.[3] **C25C** *3/08, 7/02;* **C25B** *11/03, 11/12*

U.S. Cl. 204—243 R **11 Claims**



1. In a fused salt electrolytic cell used in the production of aluminum, said cell having a pot having a floor and sidewalls, at least one anode positioned within said pot and spaced from said floor and a cathode having working faces which can be wet by aluminum, are resistant to attack by the molten electrolyte and are electrically conductive, said cathode comprising a bed of loosely packed bodies which sink in molten aluminum, said bodies being formed of a plurality of composite material elements bonded together wherein each of said plurality of composite material elements comprises a substrate material selected from the group consisting of carbon, graphite, anthracite, aluminum nitride, silicon carbide and mixtures thereof having a thin layer coating of a material selected from the group consisting of titanium diboride, titanium carbide, titanium nitride, zirconium diboride, zirconium carbide, zirconium nitride and mixtures thereof completely and densely covering the surface of said substrate wherein said composite material elements are bonded together to form said bodies.

4,511,450

PASSIVE HYDROGEL FUEL GENERATOR

Charles W. Neefe, 811 Scurry St., Big Spring, Tex. 79720

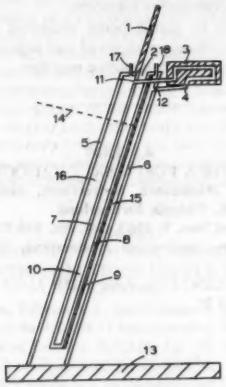
Filed Mar. 5, 1984, Ser. No. 586,352

Int. Cl.[3] **C25B** *1/04, 1/06*

U.S. Cl. 204—278 **5 Claims**

3. A hydrogen and oxygen generator comprising a first chamber having transparent front and rear surfaces, through which water is circulated and heated by absorbing the infrared portion of the sun's spectrum and dissolved hydrogen and oxygen are released from the over-saturated heated water; means for moving the heated water upward by convection in the first chamber; heat exchanger means for cooling the water and passing the heat to the atmosphere; a second chamber for receiving the lower temperature water and separated from the first heated chamber by an insulating layer of air, said second chamber having a transparent front surface supporting a plurality of photoactive receptors imbedded in a hydrophilic polymer, whereby sunlight is allowed to enter the layer of photoactive receptors and provide dissolved hydrogen and

oxygen by photoelectrolysis of the water present in the second chamber, hydrogen and oxygen dissolved in water passing



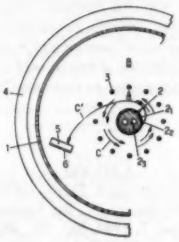
from the second chamber to the first heated chamber through a passageway provided at the lower edges of said chambers.

4,511,451

DEVICES FOR PREPARING SUBSTRATES COATED WITH A THIN LAYER OF PLATINUM OXIDE AND SUBSTRATES SO COATED

Claude Sella, Meudon La Foret; Vien Tran-Khanh, Gagny, and Jean-Claude Martin, Meudon, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Sep. 9, 1983, Ser. No. 530,676
Claims priority, application France, Sep. 10, 1982, 82 15378
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **6 Claims**



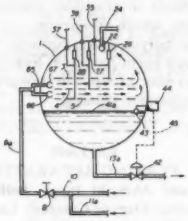
1. Device for preparing a substrate coated with a thin layer of pure platinum oxide said device comprising a magnetron including itself on the on hand means to generate a magnetic field and on the other hand, within an enclosure containing rarefied oxygen, a cathode extending parallel to the magnetic field, said cathode covered with at least a layer of platinum, and a grid forming an anode extending parallel to the cathode, facing its platinum layer, so as to preserve within the enclosure a chamber situated on the side, of the grid, opposite that where the cathode is situated, and said substrate being placed in said chamber so that its surface to be coated by the thin layer of platinum oxide is situated shielded from the impact of electrons which, coming from the cathode, are brought to circulate in this chamber after having traversed the grid.

4,511,452

PLURAL STAGE DESALTING/DEHYDRATING APPARATUS

James R. Robinson, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 187,282, Sep. 15, 1980, Pat. No. 4,374,724.
This application Feb. 16, 1983, Ser. No. 467,039
The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.
Int. Cl.³ C10G *33/02*; B01D *17/06*
U.S. Cl. 204—302 **5 Claims**



1. An apparatus for desalting oil-continuous oil-water emulsions in plural parallel stages, said apparatus comprising

a closed horizontally disposed vessel, generally cylindrical in form, there being contained within said closed vessel at least three horizontally disposed permeable planar electrodes in vertically spaced relationship, each said electrode extending substantially the entire length and width of said vessel, said electrodes thereby defining a plurality of hydraulically substantially independent coalescing stages;

distributor means positioned at and extending longitudinally along one side of said vessel and adapted to cause parallel flow of emulsion transversely from said one side to the opposite side of said vessel between adjacent planar electrodes which respectively define each of said plural stages;

conduit means for supplying emulsion to said distributor means;

product withdrawal means in the upper portion of said vessel;

water withdrawal means in the lower portion of said vessel;

said permeable electrodes and the vessel interior being adapted and arranged to permit water to pass downwardly through said electrodes to the lower portion of said vessel.

4,511,453

CORROSION INHIBITION WHEN DISTILLING COAL LIQUIDS BY ADDING CRESOLS OR PHENOLS

Kenneth L. Baumert, Emmaus, Pa.; Alberto A. Sagues, Lexington, and Burtron H. Davis, Georgetown, both of Ky., assignors to International Coal Refining Company, Allentown, Pa.

Filed Mar. 21, 1984, Ser. No. 591,737
Int. Cl.³ C10G *1/04, 7/10*
U.S. Cl. 208—8 LE **2 Claims**

1. In a process for the solvent refining of coal which includes fractionation of coal liquids containing nefarious amine hydrochloride by atmospheric or subatmospheric distillation in a fractionation tower, the improvement which consists of adding to said coal liquids, before fractionation, a compound selected from the group consisting of phenolates of Group IA, IIA, VI, VIII and IB, C_1–C_4 alkyl substituted metal phenolates, C_1–C_4 alkyl substituted metal cresols, C_1–C_4 polyalkyl metal phenolates and C_1–C_4 poly-substituted metal cresols, said selected compound having a pKb of less than 6 to reduce corrosion within said fractionation tower.

2. In a process for the solvent refining of coal which includes fractionation of coal liquids containing nefarious amine hydrochloride by atmospheric or subatmospheric distillation in a

fractionation tower, the improvement which consists of adding in the 400°–450° F. range of said fractionation tower a compound selected from the group consisting of phenolates of Group IA, IIA, VI, VIII and IB, C_1–C_4 alkyl substituted metal phenolates, C_1–C_4 alkyl substituted metal cresols, C_1–C_4 polyalkyl metal phenolates and C_1–C_4 polysubstituted metal cresols, said selected compound having a pKb of less than 6 to reduce corrosion within said fractionation tower.

4,511,454

PROCESS FOR USE OF NOVEL BORIDE CATALYST

Alan Bonny, Shaker Heights, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 408,859, Aug. 17, 1982, Pat. No. 4,439,542. This application Nov. 14, 1983, Ser. No. 550,775

Int. Cl.³ C10G *1/06, 47/02*

U.S. Cl. 208—10 **27 Claims**

1. A process for treating solid and liquid carbonaceous materials comprising the steps of:

contacting a carbonaceous material with a heterogeneous Group VIII metal boride containing catalyst and with hydrogen in the presence of a solvent in a reactor;

pressurizing said reactor with hydrogen to at least about 3.45 MPa; and

heating said reactor to a temperature of from about 200° C. to about 600° C.;

wherein said solid carbonaceous materials become partially liquified and heteroatoms are removed from said liquid carbonaceous materials.

4,511,455

CATALYSIS USING HYDROUS METAL OXIDE ION EXCHANGES

Robert G. Dosch; Howard P. Stephens, and Frances V. Stohl, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 515,844, Jul. 21, 1983, abandoned. This application Apr. 10, 1984, Ser. No. 597,590

Int. Cl.³ C10G *1/06, 47/02, 45/00, 23/00*

U.S. Cl. 208—10 **12 Claims**

1. In a hydrogenation process catalyzed by an active metal on a carrier, wherein sdid metal is a catalyst for the process, the improvement wherein the carrier is an amorphous hydrous, alkali metal or alkaline earth metal titanate, zirconate, niobate, or tantalate, in which the alkali or alkaline earth metal cations have been exchanged with a catalytically effective quantity of said catalyst metal.

4,511,456

PROCESS FOR CONTINUOUS PRODUCTION OF OPTICALLY ANISOTROPIC PITCH

Takayuki Izumi, Iruma, Japan, assignor to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1983, Ser. No. 467,617

Claims priority, application Japan, Mar. 31, 1982, 57-52731

Int. Cl.³ C10C *1/00*

U.S. Cl. 208—44 **4 Claims**

1. A process for continuous production of an optically anisotropic pitch, consisting essentially of the steps of:

(a) providing a reaction tank having an upper reaction zone and a lower settling zone;

(b) continuously feeding a starting material capable of forming an optically anisotropic pitch at elevated temperatures to said reaction zone;

(c) continuously stirring and heating said starting material fed to said reaction zone to at least about 380° C. for forming and increasing an optically anisotropic component of said starting material by thermal decomposition/-polycondensation reactions;

(d) continuously passing said heated starting material to said settling zone while maintaining the material passed to said settling zone at a temperature below about 400° C.;

(e) interposing a baffle between the reaction zone and said settling zone thereby preventing said material in said settling zone from being influenced by the stirring of said starting material in said reaction zone; and

(f) continuously removing from the bottom portion of said settling zone an optically anisotropic pitch component produced from said starting material.

4,511,457

METHOD FOR MINIMIZING FOULING OF HEAT EXCHANGER

Richard F. Miller, Humble, and Michael P. Nicholson, Houston, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 10, 1984, Ser. No. 639,897

Int. Cl.³ C10G *9/16*

U.S. Cl. 208—48 AA **5 Claims**

1. In a method of inhibiting fouling of hydrocarbon processing equipment during the processing of hydrocarbons at elevated temperatures comprising introducing into the equipment an amount of an antifoulant agent effective to substantially reduce the rate of fouling, the improvement comprising using as the agent a combination of:

(1) at least one dimer selected from the N,N' dimers of phenothiazine, halo-substituted phenothiazine, alkyl-substituted phenothiazines and haloalkyl-substituted phenothiazines, and

(2) at least one mono- or ditertiary alkyl dihydroxylbenzene compound selected from tertiary alkylcatechols, ditertiary alkylcatechols, tertiary alkylhydroquinone, ditertiary alkylhydroquinones and mixtures of these.

4,511,458

HEAVY OIL PROCESS WITH HYDRODEMETALLATION, HYDROVISBREAKING AND HYDRODESULFURATION

Alain Billon, Orlienas; Yves Jacquin, Sevres; Jean-Pierre Peries, Mornant, and Hervé Toulhoat, Le Pecq, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 30, 1983, Ser. No. 567,209

Claims priority, application France, Dec. 30, 1982, 82 22209

Int. Cl.³ C10G *23/02*

U.S. Cl. 208—59 **14 Claims**

1. A process for converting a charge of an asphaltene-containing heavy oil or heavy oil fraction to a lighter oil, comprising the steps of:

(a) passing the charge, admixed with hydrogen, under hydrodemetallation conditions, over a catalyst containing alumina and at least one metal from at least one of groups V, VI and VIII (iron group), said catalyst consisting of juxtaposed conglomerates each formed of a plurality of acicular plates, the plates of each conglomerate being generally radially oriented with respect to one another and with respect to the center of the conglomerate wherein said catalyst contains a major proportion of wedge-shaped mesopores, and has an improved resistance to pore mouth plugging compared with bimodal or monomodal porous catalysts;

(b) subjecting the effluent from step (a) to hydrovisbreaking, at a pressure of 40–200 bar, a temperature of 420°–500° C., a ratio of the normalized volume of hydrogen to the volume of charge of 300–3000, and a residence time of 10 seconds to 15 minutes; and

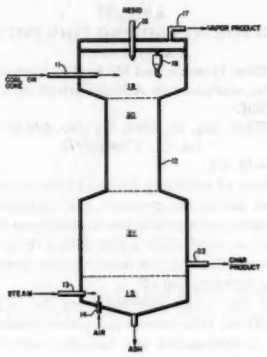
(c) treating the effluent from step (b) with hydrogen, in contact with a catalyst containing alumina and at least one metal or metal compound selected from molybdenum, tungsten, nickel, cobalt, iron or compounds thereof, under hydrodesulfuration conditions.

4,511,459

SIMULTANEOUS COKING OF RESIDUAL OIL AND PARTIAL GASIFICATION AND DESULFURIZATION OF COAL

Tsoung Y. Yan, Philadelphia, Pa., and Paul Shu, Princeton Junction, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,509
Int. Cl.³ C10G 9/32
U.S. Cl. 208—127 **11 Claims**



11. A process for the coking of residual oil and the devolatization/partial gasification and desulfurization of solid particulate fuel comprising:

burning said particulate fuel in a combustion zone in the bottom of a reactor;

supplying steam to said combustion zone to effect gasification of said particulate fuel;

withdrawing char from the bottom of said reactor;

fluidizing a bed of particulate fuel above said combustion zone with gases rising from said combustion zone;

maintaining the fluidized bed at a temperature which cokes said residual oil and devolatizes said particulate fuel; and

maintaining a high temperature, low velocity zone between said combustion zone and said fluidized bed, said particulate fuel being moved downwardly through said low velocity zone due to said withdrawal of char, said gases being moved upwardly through said low velocity zone at velocities between about 0.05–0.5 ft/sec, bed with no convection or fluidizing of the solids in said low velocity zone so that said low velocity zone is maintained at a temperature sufficiently high for calcination and desulfurization of said solid particulate fuel;

maintaining a settling zone in said reactor on top of said fluidized bed;

supplying particulate fuel to said settling zone; and

injecting residual oil into said settl zone, said particulate fuel contacting said residual oil ttling into said fluidized bed.

4,511,460

MINIMIZING CORROSION IN COAL LIQUID DISTILLATION

Kenneth L. Baumert, Emmaus, Pa.; Alberto A. Sagues, Lexington, and Burtron H. Davis, Georgetown, both of Ky., assignors to International Coal Refining Company, Allentown, Pa.

Filed Mar. 21, 1984, Ser. No. 591,668
Int. Cl.³ C10G 1/00, 7/10; C23F 11/18
U.S. Cl. 208—348 **6 Claims**

1. A coal liquefaction fractionation process including a distillation tower to reduce the presence of amine hydrochlorides therein, wherein said distillation tower separates coal liquids containing nitrogen compounds and has:

(i) a bottom region wherein the temperature is greater than 450° F.;

(ii) a middle region wherein the temperature is from 400–450° F.; and

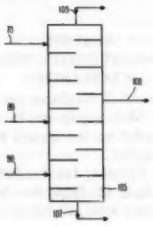
(iii) a top region wherein the temperature is below 400° F.; wherein in said process

(a) high boiling nitrogen-compound-containing streams having a boiling point of greater than 550° F. and containing amine hydrochloride precursors are introduced into said bottom region of said distillation tower;

(b) medium boiling nitrogen-compound-containing streams having a boiling point of 400°–450° F. are introduced into said middle region of said distillation tower; and

(c) low boiling nitrogen-compound-containing streams having a boiling point of less than 400° F. are introduced into said upper region of said distillation tower; and wherein said streams of (a), (b) and (c) are nitrogen-compound-containing streams that are not admixed before charge to said distillation tower.

5. A coal liquefaction fractionation process including a distillation tower to reduce the presence of amine hydrochlorides



therein, wherein said distillation tower separates coal liquids containing nitrogen compounds and has:

(i) a bottom region wherein the temperature is greater than 550° F.;

(ii) a middle region wherein the temperature is from 400°–550° F.; and

(iii) a top region wherein the temperature is below 400° F.; wherein in said process

(a) a nitrogen compound containing stream having a boiling point of greater than 550° F. and containing amine hydrochloride precursors is admixed with a second nitrogen compound-containing stream having a boiling point range of less than 450° F. to convert said amine hydrochloride precursors to amine hydrochloride and to form a low boiling stream containing amine hydrochlorides and a high boiling stream essentially free of amine hydrochlorides;

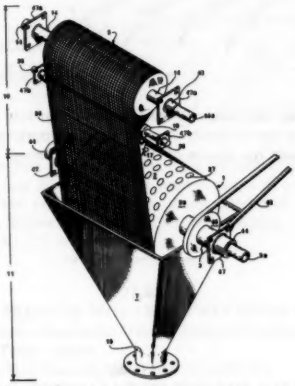
(b) water-washing said low boiling stream containing said amine hydrochlorides to remove said amine hydrochlorides to produce a low boiling stream substantially free of amine hydrochlorides; and

(c) distilling said high and low boiling streams both free of amine hydrochlorides in said fractionation system.

4,511,461
PROCESS FOR RECOVERING MINERALS AND METALS BY OLEOPHILIC ADHESION

Jan Kruyer, 4643 82nd Ave., Edmonton, Alberta, Canada (T6B 2L9)

Filed Jul. 6, 1983, Ser. No. 511,776
Int. Cl.³ B07B *13/00*
U.S. Cl. 209—47 39 Claims



1. A method for the continuous separation and removal of oleophilic surfaced mineral particles from a particulate mixture of oleophilic minerals and oleophobic gangue which comprises:

(a) providing a continuous separation and recovery system consisting of a rotating conveyor in the form of an apertured oleophilic endless sieve of uniform width supported in a separation zone by a cylindrical generally horizontal rotating cage having an apertured cylindrical sidewall, said cylindrical sidewall being partially enwrapped about the circumference thereof by said sieve, said sieve being supported in a recovery zone by a rotating conveyor roller, and said cage, conveyor roller and sieve being rotated in tandem at substantially the same surface speed such that the sieve rotates sequentially and continuously from separation zone to recovery zone;

(b) applying to the surface of said rotating sieve a coating of a viscous oleophilic oil phase adhesive as said sieve surface rotates from said recovery zone to said separation zone;

(c) continuously introducing an aqueous slurry of said particulate mixture into said rotating cage and tumbling said mixture to enhance the oleophilic nature of the surface of said mineral particles and maintain the oleophobic surface of said oleophobic gangue in contact with water to prepare said mixture for distribution on said sieve;

(d) continuously transferring said aqueous slurry mixture through the apertures of said cylindrical sidewall of said cage onto the surface of said oleophilic oil phase adhesive coated oleophilic sieve across the width thereof causing the mineral particles to contact and adhere to the oil phase adhesive coating on the surfaces of said sieve and the oleophobic gangue particles and aqueous phase to pass through said sieve apertures; and

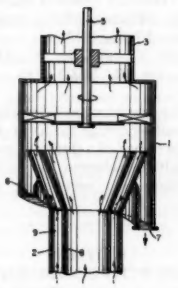
(e) continuously rotating said sieve containing said adhered mineral particles and oil phase adhesive away from contact with said rotating cage and out of said separation zone into said recovery zone wherein heat is transferred to the sieve and where the adhered mineral particles and oil phase adhesive are recovered from said oleophilic sieve; and

(f) continuously rotating said sieve away from said recovery zone for recoating with the viscous oleophilic oil phase coating.

4,511,462
METHOD AND APPARATUS FOR SORTING PARTICULATE MATERIAL

Jan Folsberg, Copenhagen, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Aug. 23, 1982, Ser. No. 410,638
Claims priority, application United Kingdom, Sep. 1, 1981, 8126461
Int. Cl.³ B07B *7/083*
U.S. Cl. 209—140 8 Claims



1. A method for separating particulate material into coarse and fine fractions each including a portion of an intermediate fraction comprising:

(a) suspending the material in a conveying gas flow;

(b) directing the conveying gas suspension in a radially symmetrical flow pattern in a given direction;

(c) directing a band of clean gas in said direction so as to concentrically surround the gas suspension with a band of clean gas containing substantially no particulate so as to contain the fine and fine-intermediate fractions, in the suspension gas, said band of clean gas having substantially the same velocity as the gas suspension;

(d) directing the conveying gas flow and said band of clean gas past a vaned rotating rotor having an axis of rotation axially aligned with the concentric axis of the gases;

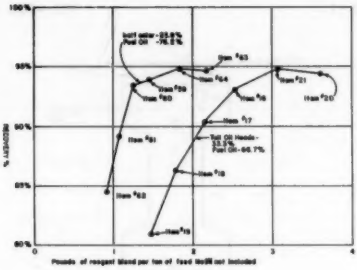
(e) flinging the coarse and coarse-intermediate fractions in a radially outward direction by action of the vaned rotor; and

(f) directing the remaining fine and fine-intermediate fractions in the gas flow past the rotor for subsequent separation from the gas.

4,511,463
PROCESS FOR RECOVERY OF PHOSPHATE ORE

Edward N. Alexander, and Richard Smith, both of Opelika, Ala., assignors to West-Point Pepperell, Inc., West Point, Ga.

Continuation of Ser. No. 809,632, Jun. 24, 1977, abandoned.
This application Dec. 1, 1978, Ser. No. 965,394
Int. Cl.[3] B03D *1/14*
U.S. Cl. 209—166 3 Claims



1. In a method for the flotation of phosphate ore in the presence of water containing an organic acid, oil;
the improvement wherein the organic acid is a half-ester of an organic dicarboxylic acid and at least one saturated aliphatic alcohol containing at least 11 carbon atoms.

4,511,464
1,3-OXATHIOLANE-2-THIONES AS SULFIDE MINERAL COLLECTORS IN FROTH FLOTATION

Roger W. Bergman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 22, 1983, Ser. No. 516,082
Int. Cl.[3] B03D *1/14*
U.S. Cl. 209—166 12 Claims

1. A process of concentrating sulfide ores, which comprises subjecting a metal sulfide ore, in the form of a pulp, to a flotation process in the presence of a flotating amount of a flotation collector for the sulfides wherein the collector comprises a 1,3-oxathiolane-2-thione and recovering the desired metal sulfide in the froth.

4,511,465
ORE FLOTATION WITH COMBINED COLLECTORS

Clarence R. Bresson, c/o French, Hughes and Doescher P.O. Box 2443, Bartlesville, Okla. 74005

Filed Jun. 11, 1984, Ser. No. 619,254
Int. Cl.[3] B03D *1/14*
U.S. Cl. 209—166 23 Claims

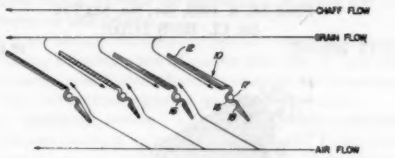
1. A composition comprising a mixture which contains both of the following compounds in substantial quantities
(a) S-allyl-S'-n-butyl trithiocarbonate; and
(b) a compound selected from the group consisting of N,N,S-triethyl dithiocarbamate, N,N-diethyl-S-n-butyl dithiocarbamate, and mixtures thereof.

4,511,466
CHAFFER SLAT

Dennis J. Jones, West Brooklyn, and Gary L. Kunz, Mendota, both of Ill., assignors to Hart-Carter Company, Mendota, Ill.

Filed Dec. 14, 1983, Ser. No. 561,300
Int. Cl.[3] A01F *12/44*; B07B *1/34*
U.S. Cl. 209—395 2 Claims

1. A harvester chaffer slat comprising a sheet metal blade having uniformly spaced fingers formed along its upper edge to provide open spaces between the fingers, the blade being bent rearwardly from the plane of its fingered portion in a manner as to form a forwardly and generally upwardly opening, semi-circular channel extending lengthwise of the blade and an angularly projecting air flow baffle portion extending downwardly from the channel and lying wholly within a plane

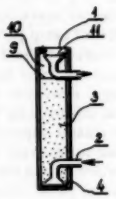


intersecting the plane of said fingered portion, said channel being of a size to firmly receive a slat supporting rod leaving spaced apart the apexes of the channel opening.

4,511,467
APPARATUS FOR THE SIMULTANEOUS FORMATION AND SEPARATION OF A LIQUID SUSPENSION

Frantisek Hereit, and Silvestr Mutl, both of Prague, Czechoslovakia, assignors to Hydroprojekt, Prague, Czechoslovakia

Filed Jul. 26, 1982, Ser. No. 401,749
Claims priority, application Czechoslovakia, Jul. 27, 1981, 5713-81
Int. Cl.[3] B01D *15/00*
U.S. Cl. 210—173 3 Claims

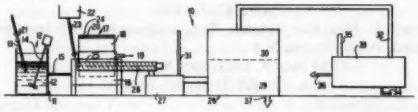


1. Apparatus for the formation of coating layers from a treated liquid upon the particles of a liquid suspension of particulate solid material and for thereafter separating the coating layers from the thus coated particles, said apparatus comprising a reactor and regenerating and handling equipment, the reactor being in the form of a container retaining a fluid layer of particulate material, a source of supply of treated liquid, feed piping connected between said source of supply and the container for conducting treated liquid into the reactor, a source of a destabilization agent, and means extending between the source of destabilization agent and the feed piping for feeding the destabilization agent into said feed piping, the supply of destabilization agent being connected to the feed piping for the treated liquid upstream of the discharge thereof into the fluid layer, the reactor being connected to an equipment for discharging the coated particles from the reactor and also being connected to an equipment for the replenishment of the fluid layer in the reactor, between the equipment for the discharge of the coated particles and the equipment for the replenishment of the fluid layer in the reactor there being interposed equipment for crushing the coated particles to remove the coating therefrom.

4,511,468
ROTARY VACUUM PRE-COAT FILTER APPARATUS

Harold R. White, New Lenox, Ill., assignor to Alar Engineering Corporation, Mokena, Ill.

Continuation-in-part of Ser. No. 296,135, Aug. 25, 1981,. This application Dec. 8, 1983, Ser. No. 559,273
Int. Cl.[3] B01D *33/06*
U.S. Cl. 210—181 9 Claims

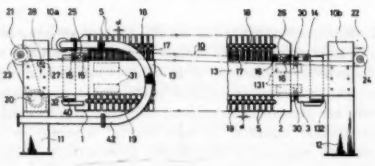


1. In a pre-coat rotary vacuum filter system including an evacuated rotary filter drum, the improvement of a filter aid pre-coat on the periphery of the drum composed of rigid, granular,non-fibrous combustible material having a particle size of from 30–125 microns.

4,511,469
FILTER PRESS OF MOVABLE TWIN HEAD TYPE

Akitoshi Iwatani, Marugame, Japan, assignor to Ishigaki Kiko Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1982, Ser. No. 444,675
Int. Cl.[3] B01D *25/14*
U.S. Cl. 210—225 10 Claims



1. A filter press of movable twin head type having a plurality of filter plates movably arranged on a pair of parallel guide rails supported by machine frames, a pair of heads, including a one head and an other head, (1, 2) disposed in such a way that the filter plates are entrained therebetween, the filter plates and the heads (1, 2) being movably connected by loose connecting means so that the filter plates may be separated to give definite intervals therebetween or assembled to close the intervals and so that the heads each may be separated from or brought close to an adjacent filter plate, characterized in;

(i) that said pair of heads (1, 2) are movably supported on said pair of parallel guide rails;

(ii) that said pair of heads (1, 2) are connected by simultaneous drive means for moving the heads (1, 2) in such manner that the filter plates are moved in a predetermined forward, plate-closing direction one after another beginning from those nearest to the heads to close the intervals between the filter plates, and that the filter plates are moved in a reverse, plate-separating direction one after another beginning from those nearest to the heads to provide intervals between the filter plates;

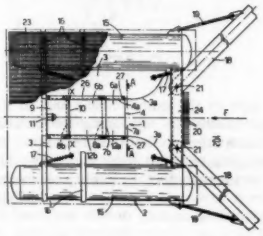
(iii) that said one head is provided with ready-to-engage latch means for holding said one head in a predetermined forward position and without retreat relative to the guide rails as the filter plates are completely assembled, the other head being provided with locking means for further tightening the filter plates in their assembled condition; and

(iv) that said locking means provided with said other head comprises a movable beam (3) which is movably supported on said pair of guide rails for movement therealong and which is behind said other head and connected to said other head through loose connecting means including hydraulic cylinder means (30) disposed between and connected to said other head and the movable beam (3) so that an interval between the beam (3) and said other head may be adjusted, and ready-to-engage latch means for holding the movable beam (3) in its forward position and without retreat relative to the guide rails.

4,511,470
APPARATUS FOR THE RECOVERY OF OILS OR OTHER SIMILAR SUBSTANCES FLOATING ON STREAMING WATER COURSES

Giuseppe Ayroldi, Via Guido Zanobini, N., Rome, 55, Italy

Filed Mar. 1, 1984, Ser. No. 585,230
Claims priority, application Italy, Mar. 1, 1983, 47830 A83
Int. Cl.[3] C02F *1/40*
U.S. Cl. 210—242.3 7 Claims



1. Apparatus for the recovery of oily substances or similar products, floating on water courses, comprising: an independently floating skimming platform for the removal of the oil matter, an independently floating support platform connected to the skimming platform for independent floating movement relative to the skimming platform; the skimming platform including two lateral, symmetrical floats submerged only slightly under the water level and supporting a central structure comprising an intake channel which in turn has at least two sections operating in series, each of the intake channel sections having a threshold that can be adjusted to a desired depth, and a downwardly and rearwardly inclined bottom panel having an upper forward edge forming the lower boundary of said threshold, the slopes of the bottom panels generally increasing progressively in the direction of flow, the intake channel sections being positioned to provide a transverse aperture at the bottom rear edge of each section, a chamber positioned at the end of the intake channel fitted with a suction pipe connected to a pump for the retrieval of skimmed oily liquid from the chamber, the chamber being separated from the intake channel by a vertical, forward facing transverse front panel, whose bottom edge is slightly above the bottom panel of the last section of the intake channel, and a floating gate hinged to the top edge of the chamber front panel; the hinged gate mounted for oscillation about a transverse axis, depending on hydraulic pressure on opposite sides of the gate.

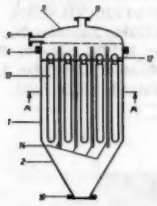
4,511,471
FILTER APPARATUS FOR CONTINUOUSLY THICKENING SUSPENSIONS

Hans Müller, Erlenbach, Switzerland, assignor to DrM, Dr. Müller AG, Männedorf, Switzerland

Filed Jun. 2, 1983, Ser. No. 500,313
Claims priority, application Switzerland, Jun. 3, 1982, 3401/82
Int. Cl.[3] B01D *29/32, 35/12*
U.S. Cl. 210—323.2 3 Claims

1. A filter apparatus for continuously thickening suspensions, comprising: a housing defining a chamber therein and having an axis, a filtrate chamber portion, and a slurry chamber portion; a plurality of individual collecting pipes arranged in

the chamber of the housing; a plurality of filter elements mounted on the collecting pipes for providing filtration with formation of a filtrate, each of the filler elements having an upper edge and a lower edge; outlet means for allowing the filtrate to be discharged and a pressure gas conduct for introducing gas through respective ones of the filter elements in counterdirection to the filtration when filtration is to be stopped for cleaning the respective filter elements, said allowing means including valves each associated with a respective



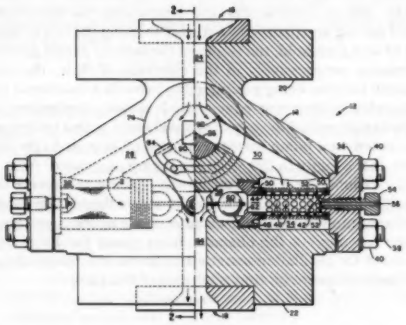
collecting pipe to the outlet means and to the pressure gas conduit; and means for separating the individual collecting pipes from each other so that the gas is prevented from acting on and damaging adjacent filter elements still filtrating, said separating means including a plurality of stationary intermediate walls each arranged between two individual collecting pipes and extending equally deeply into said filtrate chamber portion and into said slurry chamber portion of said chamber beyond the upper edge and lower edge of the filter elements.

4,511,472

APPARATUS FOR CONTINUOUS POLYMER FILTRATION

Delano B. Trott, Salem, Mass., assignor to Beringer Co., Inc., Marblehead, Mass.

Filed Mar. 30, 1983, Ser. No. 480,330
Int. Cl.³ B01D *35/12*
U.S. Cl. 210—340 **2 Claims**



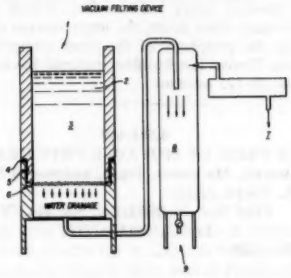
1. In a polymer filtration system comprising a body having means defining an inlet, means defining an outlet, means defining first and second channels each connecting the inlet and outlet, a replaceable filter in each channel, and a rotatable valve member formed to connect the inlet and outlet, in a first position of the valve member through the first channel only, and in a second position of the valve member through the second channel only, the valve member being formed to connect the inlet and outlet through both channels in a third position of the valve member intermediate between said first and second positions, escapement means to limit movements of the valve member comprising a cam plate rotatable with the valve member and having surface contours formed thereon, and a link pivoted on the body and having a portion slidably engaging said contours, said contours including a pair of detents formed therein to cause the movement of the valve member from the third position to the first and second positions to be limited to an alternate sequence.

4,511,473

FIBROUS MEDIA CONTAINING MILLIMICRON-SIZED PARTICULATES

Kenneth C. Hou, San Antonio, Tex., assignor to AMF Incorporated, White Plains, N.Y.

Filed Feb. 9, 1982, Ser. No. 347,360
Int. Cl.³ B01D *39/04, 39/06*
U.S. Cl. 210—348 **48 Claims**



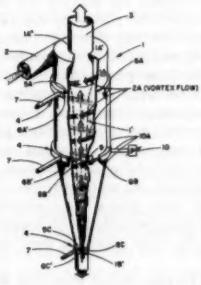
1. A self supporting fibrous matrix containing immobilized therein at least about 5% by weight of microparticulate material with an average diameter of less than 1 micron, an organic polycationic resin and an organic polyanionic resin, wherein said resins are present in an amount effective to flocculate said microparticulate material in said matrix, wherein said microparticulate material is distributed substantially uniformly throughout a cross-section of said matrix.

4,511,474

CYCLONE SEPARATOR HAVING BOUNDARY LAYER TURBULENCE CONTROL

Coimbatore R. Krishna, Mt. Sinai, and Julius S. Milau, Port Jefferson, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 27, 1984, Ser. No. 574,782
Int. Cl.³ B04C *3/06*
U.S. Cl. 210—512.1 **14 Claims**



1. In a cyclone separator for separating fluid from particulate material entrained therein, comprising:

a hollow body including wall means defining a generally cylindrical section and an adjacent frusto-conical section; fluid flow inlet means and primary fluid outlet means for directing, respectively, the flow of a fluid into and out of said hollow body, and further including vortex generating means for generating a vortex flow of fluid within said hollow body, whereby the fluid is cleansed by having entrained particulate material separated from the fluid as it flows through the vortex to the primary fluid outlet means;

wherein the improvement comprises said cyclone separator having a boundary layer turbulence control means for substantially reducing radially inward movement of particulate material in the vortex flow of said fluid, said boundary layer turbulence control means being operable to remove from said hollow body fluid with densely entrained particulate material, at a predetermined fluid pressure, from a plurality of selected critical areas at vertically spaced loci along the vortex flow path, whereby said removed particulate material is prevented from inducing turbulence in the boundary layer of the vortex flow at said selected areas, said plurality of selected areas from which densely entrained particulate material and fluid are removed including both of the areas of surface irregularity on said wall means immediately adjacent to the perimeters of the axial extremeties of said frusto-conical section.

4,511,475

OPTICALLY ACTIVE POLYMER PREPARATION AND USE

Heimei Yuki, Sakai, and Yoshio Okamoto, Amagasaki, both of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

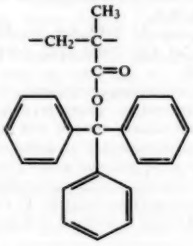
Division of Ser. No. 235,233, Feb. 17, 1981, Pat. No. 4,375,495. This application Nov. 22, 1982, Ser. No. 443,725

Claims priority, application Japan, Feb. 19, 1980, 55-19555

Int. Cl.³ B07C *5/36*

U.S. Cl. 210—635 **9 Claims**

1. A process for the optical resolution of a racemic mixture which comprises contacting the racemic mixture with a stereoregular, highly isotactic, optically active polymer comprising recurring structural units of the formula:



and having a polymerization degree of not less than 5, said polymer having a specific rotation $[\alpha]_D^{20}$ of not less than 50° as an absolute value, either + or −.

4,511,476

METHOD FOR PREVENTING COMPACTION IN SORBENT BEDS

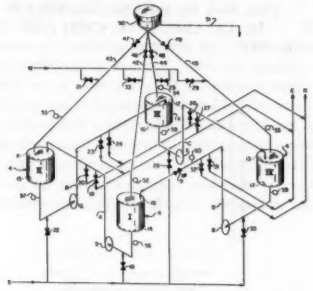
Karlheinz W. Schoenrock, Ogden, Utah, assignor to The Amalgamated Sugar Company, Ogden, Utah

Filed Jan. 17, 1983, Ser. No. 458,273

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—678 **6 Claims**

1. In a simulated moving bed process in which a plurality of sorbent beds are contained within respective vessels with inlets and outlets connected in a loop so that circulating liquid moves in sequence through said beds while process input streams are cyclically introduced in corresponding sequence to said loop at selected locations associated with said vessels, and compensating process output streams are withdrawn in similarly corresponding sequence from said loop at other selected locations associated with said vessels, all while maintaining a forward



flow in a fixed direction through the loop during a plurality of cycles, the improvement which comprises periodically reversing the direction of flow of said circulating liquid through a selected said sorbent bed while maintaining said forward flow through said loop.

4,511,477

PROCESS OF USING WATER-ABSORBENT AGENTS FOR LOW PH APPLICATIONS

Mark J. McKinley, Linwood, and Jim W. Sanner, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 17, 1983, Ser. No. 542,873

Int. Cl.³ B01D *37/00;* **C02F** *1/00*

U.S. Cl. 210—689 **7 Claims**

1. A process for effectively absorbing water in the form of an aqueous medium having a pH of less than 4 which process comprises:

contacting said aqueous medium with a water-swellable polymer comprising an alkali metal sulfonic acid salt containing polyelectrolyte which is crosslinked in an amount sufficient to provide swellability to said polyelectrolyte, wherein

the amount of said sulfonic acid salt moieties in said polyelectrolyte is sufficient to provide water absorbent activity, wherein

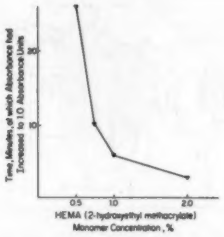
said sulfonic acid salt containing polyelectrolyte maintains an ionic form over a lower pH range than a swellable polyelectrolyte containing alkali metal carboxylic acid salt moieties having (1) a similar molecular weight and (2) a similar concentration of acid salt moieties to that of said alkali metal sulfonic acid salt polyelectrolyte, and wherein

said sulfonic acid salt containing polyelectrolyte provides improved water absorbent capability over a lower pH range than said swellable polyelectrolyte containing alkali metal carboxylic acid salt moieties.

4,511,478
POLYMERIZABLE COMPOUNDS AND METHODS FOR PREPARING SYNTHETIC POLYMERS THAT INTEGRALLY CONTAIN POLYPEPTIDES

Robert C. Nowinski, and Allan S. Hoffman, both of King County, Wash., assignors to Genetic Systems Corporation, Seattle, Wash.

Filed Nov. 10, 1983, Ser. No. 550,929
Int. Cl.³ C08L 89/00; C08H 1/00
U.S. Cl. 210—691 5 Claims



1. A method of selectively removing substances from a solution or mixture, comprising:

covalently bonding a polymerizable organic monomer to a polypeptide that has binding activity to the substance to form a monomer/polypeptide conjugate;

contacting the substance with the monomer/polypeptide conjugate; and

polymerizing the monomer/polypeptide conjugate to form an insoluble polymer which can be separated from the solution.

4,511,479
OIL REMOVAL FROM WATER SUSPENSIONS USING IONIC DOMAIN POLYMERS

Everett J. Fuller, Gillette, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 333,130, Dec. 21, 1981, abandoned. This application Feb. 3, 1983, Ser. No. 463,341
Int. Cl.³ C02F 1/54
U.S. Cl. 210—708 3 Claims

1. A process for the purification of water containing emulsified oil particles which consists essentially of the steps of:

(a) adding sufficient amounts of neutralized sulfonated polymer to said water containing said emulsified oil particles to have said neutralized sulfonated polymer interact with said oil particles, wherein said neutralized sulfonated polymer is a elastomer polymer selected from the group consisting of EPDM terpolymer and Butyl rubber, and has about 5 to about 50 meq. of sulfonate groups per 100 grams of said neutralized sulfonated polymer, and about 1 to about 60 parts by weight per hundred parts by weight of said neutralized sulfonated polymer of a preferential plasticizer selected from the group consisting of carboxylic acids having about 8 to about 22 carbon atoms and metallic salts of said carboxylic acids having about 8 to about 22 carbon atoms, incorporated therein

(b) stirring the mixture of said neutralized sulfonated polymer and said water containing said emulsified oil particles for a sufficient period of time to cause interaction of said oil particles with said neutralized sulfonated polymer, said oil particles and said neutralized sulfonated polymer separating from said water as a distinct oil/neutralized polymer layer; and

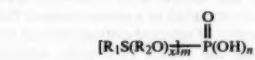
(c) separating said water layer from said oil/neutralized sulfonated polymer layer.

4,511,480
CORROSION INHIBITION IN DEEP GAS WELLS BY PHOSPHATE ESTERS OF POLY-OXYALKYLATED THIOLS

Benjamin T. Outlaw; Bernardus A. Oude Alink, both of St. Louis, Mo.; Joe A. Kelley, Collinsville, Ill., and Carol S. Claywell, St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

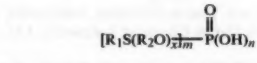
Filed Jul. 20, 1983, Ser. No. 515,223
Int. Cl.³ C23F 11/00; F17D 1/04
U.S. Cl. 252—8.55 E 9 Claims

1. The method of inhibiting corrosion of ferrous metals which comprises contacting said metals with an effective amount of an inhibitor having the formula



wherein R_1 represents alkyl, cycloalkyl, aryl, aralkyl and heterocyclyl; R_2 represents alkyl; x represents an integer of from 2 to about 4; m represents an integer which is 1 or 2; n represents the integer 1 when m is 2 and represents 2 when m is 1 and the amine and quaternary ammonium salts thereof.

7. The method of inhibiting corrosion of metals in gas wells and distribution systems therefor which comprises adding thereto an effective amount of an inhibitor having the formula



wherein R_1 represents alkyl, cycloalkyl, aryl, aralkyl and heterocyclyl; R_2 represents alkyl; x represents an integer of from 2 to about 4; m represents an integer which is 1 or 2; n represents the integer 1 when m is 2 and represents 2 when m is 1 and the amine and quaternary ammonium salts thereof.

4,511,481
MULTIFUNCTIONAL ADDITIVES

Joosup Shim, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,028
Int. Cl.³ C10M 1/32, 1/44
U.S. Cl. 252—32.5 18 Claims

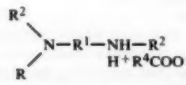
1. A lubricant composition comprising a major amount of an oil of lubricating viscosity or grease prepared therefrom and a minor effective antioxidant, antirust and antiwear improving amount of of a triazole adduct of an amine phosphate obtained by reacting said triazole and said amine phosphate in a 1:3 to about 3:1 ratio of triazole to amine phosphate and carried out at temperatures ranging from about 80° C. to about 125° C. for about 1 to about 8 hours at ambient or higher pressures.

4,511,482
N-HYDROCARBYLHYDROCARBYLENEDIAMINE CARBOXYLATE AND LUBRICANTS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 29, 1983, Ser. No. 508,980
Int. Cl.³ C10M 1/36
U.S. Cl. 252—34 22 Claims

1. A compound of the formula:



wherein R is a hydrocarbyl group containing 6 to 20 carbon atoms, R^1 is a C_2 to C_3 hydrocarbylene group, R^2 is selected from the group consisting of hydrogen and

wherein at least one R^2 is the latter group in which R^3 is selected from the group consisting of hydrogen and a C_1 to C_6 alkyl group, and R^4 is a C_1–C_{20} hydrocarbyl group.

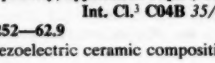
4,511,483

PIEZOELECTRIC CERAMIC COMPOSITIONS

Toshio Ogawa, Kyoto, and Toshihiko Kittaka, Nagaokakyo, both of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 485,906, Apr. 18, 1983, abandoned, which is a continuation of Ser. No. 299,635, Sep. 4, 1981, abandoned. This application Jan. 18, 1984, Ser. No. 571,153
Claims priority, application Japan, Sep. 5, 1980, 55-123878
Int. Cl.³ C04B *35/46*
U.S. Cl. 252—62.9 **7 Claims**

1. A piezoelectric ceramic composition comprising a major component,



(where $0.01 \leqq X \leqq 0.40$ and $0 \leqq \alpha \leqq 1$), and CuO contained therein as an additive in an amount of 0.05 to 2.5 wt% with respect to the weight of 1 mole of the major component, said piezoelectric ceramic composition exhibiting a temperature coefficient of resonant frequency which is either a positive value or a smaller negative value than said composition containing less than 0.05 weight % CuO.

4,511,484

PROCESS FOR PREPARING MAGNETIC COATING COMPOSITION

Masashi Anonuma; Yasuo Tamai; Tsunehiko Sato; Shinichi Funabashi, and Hiroshi Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Kanagawa, Japan

Filed May 18, 1983, Ser. No. 495,869
Claims priority, application Japan, May 18, 1982, 57-83567
Int. Cl.³ H01F *1/00, 1/26*
U.S. Cl. 252—62.54 **13 Claims**

1. A process for preparing a magnetic coating composition, comprising the steps of kneading a magnetic metal powder, 0.1 to 10 parts by weight of an abrasive per 100 parts by weight of the metal powder, 5 to 20 parts by weight of a main binder per 100 parts by weight of the metal powder, and 0 to 60 parts by weight of a solvent per 100 parts by weight of the metal powder, while applying a shearing stress of from about 20 to about 30 kg/cm², wherein the process is carried out in an atmosphere containing 11% oxygen or less.

4,511,485

NONPOLLUTING SALTS AND METHOD OF MAKING SAME

Alan B. Gancy, 265 Robineau Rd., Syracuse, N.Y. 13207

Continuation-in-part of Ser. No. 319,473, Nov. 9, 1981, abandoned. This application Apr. 20, 1983, Ser. No. 486,853
Int. Cl.³ C09K *3/18;* **C01F** *5/00, 11/00;* **C07C** *51/41*
U.S. Cl. 252—70 **30 Claims**

2. A non-deliquescent salt mixture having good water solubility comprised of calcium acetate, magnesium acetate and calcium chloride wherein the mixture has a mole ratio of calcium chloride-to-calcium acetate ranging between 0 and 1.0.

4,511,486

METHOD OF CLEANING DENTURES USING AERATED FOAMS

Nutan B. Shah, New Rochelle, N.Y., assignor to Richardson-Vicks Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 316,981, Nov. 2, 1981, abandoned. This application Mar. 7, 1983, Ser. No. 470,589
Int. Cl.³ C11D *1/72, 7/50*
U.S. Cl. 252—90 **12 Claims**

1. A method of cleansing dentures which comprises maintaining said dentures in contact with an aerated denture cleanser foam for a time sufficient to cleanse said dentures without brushing and subsequently removing any foam residue from the dentures, said foam consisting of a mixture of air and a foam-producing liquid composition comprising a pharmaceutically acceptable surfactant, an alcohol component selected from the group consisting of ethanol, isopropanol and mixtures thereof, a pharmaceutically acceptable humectant and water.

4,511,487

DISHWASHER DETERGENT PASTE

Horst Prühs, and Theodor Altenschöpfer, both of Düsseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 22, 1983, Ser. No. 525,325
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310684
Int. Cl.³ C11D *3/08, 17/00, 3/395*
U.S. Cl. 252—99 **6 Claims**

1. A detergent paste for use in dishwashers comprising of a pasty, thixotropic cleaning agent with a viscosity of from 30 Pa.s. to 850 Pa.s. at 20° C. as determined with a rotational viscosimeter at a spindle speed of 5 revolutions per minute consisting essentially of

(A) a mixture of from 3% to 40% by weight of sodium tripolyphosphate hexahydrate and from 5% to 30% on an anhydrous basis of sodium metasilicate pentahydrate, both having an average particle size of less than 0.3 mm.,

(B) from 0.1% to 3.0% by weight of active chlorine of an alkali metal hypochlorite,

(C) from about 1% to 10% by weight of a swellable foliated silicate of the hectorite type having fine particles with less than 1% by weight retained on a 0.25 mm mesh seive and being capable of forming a thixotropic gel in water,

(D) from 0 to 5% by weight of nonionic tensides which have a low foaming capacity, do not decompose in the presence of active chlorine compounds and are alkali stable, and

(E) sufficient water to give the desired viscosity, all based upon the total weight of the detergent composition.

4,511,488

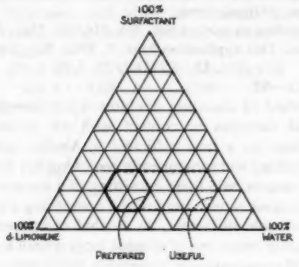
D-LIMONENE BASED AQUEOUS CLEANING COMPOSITIONS

Grant B. Matta, Dover, N.J., assignor to Penetone Corporation, Tenafly, N.J.

Filed Dec. 5, 1983, Ser. No. 558,040
Int. Cl.³ C11D *7/22*
U.S. Cl. 252—162 **17 Claims**

1. A d-limonene based liquid cleaning composition for cleaning hard or flexible substrates, said composition, per 100 parts by weight, comprising 78 to 96 parts by weight of a d-limonene/surfactant/water mixture containing by weight 10–60% stabilized d-limonene, 10–30% surfactant and 20–70% water, 2–10 parts of coupling agent, and 2–12 parts of additives adapting the composition to particular uses, said composition

being characterized as being free of petroleum derived or chlorinated hydrocarbon solvents, as having a flash point not



lower than 160° F. (C.O.C.), and as being a stable, flowable, clear, homogeneous liquid composition.

4,511,489

COMPOSITION FOR CLEANING AND IMPARTING ANTISTATIC PROPERTIES TO PLASTICS SURFACES

Luz P. Requejo, and Charles J. Butke, both of Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed Jun. 1, 1983, Ser. No. 499,944
Int. Cl.³ C09D *9/00*
U.S. Cl. 252—172 **26 Claims**

1. A wax-free composition for cleaning polyacrylic and polycarbonate plastic surfaces which, on an active basis by weight of said composition, consists essentially of:

(a) from 0.5 to about 10% of a fluid silicone oil having lubricating activity, said silicone oil being a polydimethylsiloxane having a viscosity of from 40 to 100,000 centistokes at 25° C.;

(b) from about 0.1 to 5% of an anionic or nonionic surfactant;

(c) from about 0.005 to 1% of an anionic or nonionic fluorinated organic surface active compound selected from the group consisting of:

(i) anionic fluorinated hydrocarbon surfactants wherein the fluorinated hydrocarbon has a branched chain structure and having aliphatic perfluorocarbon groups at one end thereof;

(ii) nonionic fluorinated hydrocarbon surfactants having a fluorinated hydrocarbon portion exhibiting a branched structure and having the formula:

$$R_f(OCH_2CH_2)_nOR_f$$

wherein R_f is C_8F_{15}, $C_{10}F_{19}$ or $C_{12}F_{23}$ and n is an integer from 10 to 30;

(iii) nonionic fluorinated hydrocarbon surfactants wherein the fluorinated hydrocarbon portion exhibits a branched structure and having the formula:

$$R_f(OCH_2CH_2)_mOR$$

wherein R_f is as in (ii), R is a lower alkyl and m is an integer from 2 to 10; and

(iv) anionic fluorinated hydrocarbon surfactants wherein the fluorinated hydrocarbon portion exhibits a straight chain structure and having aliphatic perfluorocarbon groups at one end of the chain thereof, and

(d) water,

said composition containing less than 0.5% by weight of an organic solvent.

4,511,490

COOPERATIVE ENZYMES COMPRISING ALKALINE OR MIXTURES OF ALKALINE AND NEUTRAL PROTEASES WITHOUT STABILIZERS

Anna G. Stanislowski, Tracy, and Richard J. Wiersema, Pleasanton, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Jun. 27, 1983, Ser. No. 508,449
Int. Cl.³ C11D *7/42, 3/386;* D06M *16/00*
U.S. Cl. 252—174.12 **33 Claims**

1. A stable, cooperative enzyme system comprising at least two enzymes having activity for a relatively complex substrate which must contain at least one protein, with at least partial activity over the same pH range, wherein their combined activity is greater than the sum of their individual activities as determined by the formula:

$$\frac{[\text{Actual Activity } (E_1 + E_2) - \text{Expected Activity } (E_1 + E_2)]}{\text{Expected Activity } (E_1 + E_2)} \times 100\%$$

wherein E_1 and E_2 are said enzymes;

wherein said enzymes are alkaline or mixtures of alkaline and neutral proteases; and

wherein no stabilizers are present when said enzymes are mixtures of alkaline and neutral proteases.

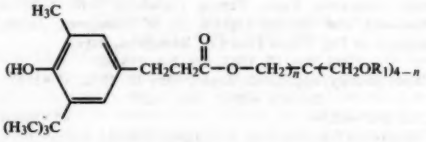
4,511,491

STABILIZERS FOR SYNTHETIC RESINS

Tamaki Ishii, Suita; Shinichi Yachigo, and Yukoh Takahashi, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Jul. 15, 1983, Ser. No. 514,021
Claims priority, application Japan, Jul. 26, 1982, 57-130634; Dec. 27, 1982, 57-231293
Int. Cl.³ C09K *15/08*
U.S. Cl. 252—404 **12 Claims**

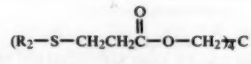
1. A stabilizer for synthetic resins, of which the effective ingredient is a mixture composed of a phenolic compound (I) represented by the general formula (I):



(I)

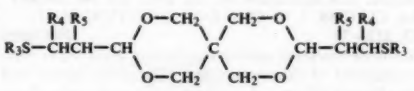
wherein R_1 is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or an acyl group having 1 to 5 carbon atoms; and n is an integer from 1 to 4,

and at least one sulfur-containing compound (II) selected from compounds represented by the general formulas (II-1) and (II-2):



(II-1)

wherein R_2 is an alkyl group having 4 to 20 carbon atoms, and



(II-2)

wherein R_3 is an alkyl group having 3 to 18 carbon atoms,

and R_4 and R_5 each independently is a hydrogen atom or an alkyl group having 1 to 6 carbon atoms,
in the ratio (I):(II) of 1:0.5–15 by weight.

4,511,492

ELECTRICALLY CONDUCTING AROMATIC AZOPOLYMERS AND METHOD OF PREPARATION

Raymond J. Swedo, Mount Prospect, and David W. House, Arlington Heights, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 19, 1983, Ser. No. 543,655
Int. Cl.³ H01B 1/06
U.S. Cl. 252—500 **14 Claims**

1. A method of preparing an electrically conducting polymeric composition comprising adding to a polymer whose repeating unit has the structure

$$-Ar-(X-Ar')_a-N=N-$$

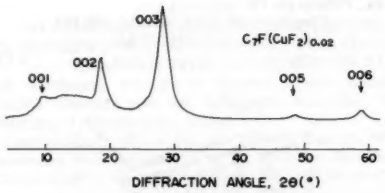
where Ar and Ar' are independently selected from the group consisting of divalent aromatic nuclei whose parent is benzene, biphenyl, naphthalene, anthracene, chrysene, pyridine, thiophene, pyrrole, furan, imidazole, oxazole, quinoline, carbazole, pyrimidine, or purine, X is O, C=O, S, SO, SO_2, or CH_2, and a is 0 or 1, an effective amount, sufficient to increase electrical conductivity, of a dopant and recovering the resulting doped polymer.

4,511,493

TERNARY INTERCALATION COMPOUND OF A GRAPHITE WITH A METAL FLUORIDE AND FLUORINE, A PROCESS FOR PRODUCING THE SAME, AND AN ELECTRICALLY CONDUCTIVE MATERIAL COMPRISING THE TERNARY INTERCALATION COMPOUND

Nobuatsu Watanabe, 136 Uguisudai, Nagaokakyo-shi, Kyoto; Tsuyoshi Nakajima, Kyoto, and Masayuki Kawaguchi, Arida, all of Japan, assignors to Nobuatsu Watanabe, Kyoto, Japan

Filed Sep. 8, 1983, Ser. No. 530,239
Claims priority, application Japan, Mar. 9, 1983, 58-37263
Int. Cl.³ B01J 27/12; H01B 1/04
U.S. Cl. 252—507 **7 Claims**



3. A process for producing a ternary intercalation compound of a graphite with a metal fluoride and fluorine represented by the formula

$$C_xF(MF_2)_y$$

wherein M is a metal selected from the group consisting of Pb, transition elements, alkaline earth metals exclusive of Mg and metals in group IIIA of the periodic table exclusive of Al; x is about 1 to about 100; y is about 0.0001 to about 0.15; and z is the valence of M, said metal being one of which the fluoride has a boiling point of about 400° C. or more or one of which the fluoride has a sublimation point of about 400° C. or more, which comprises reacting a graphite material with a metal fluoride having a boiling point of about 400° C. or more or a sublimation point of about 400° C. or more and selected from the group consisting of fluorides of Pb, transition elements, alkaline earth metals exclusive of Mg and metals in group IIIA of the periodic table exclusive of Al in an atmosphere of fluorine gas at a temperature of 0° C. to 400° C. for at least a period of time to effect a weight increase in the graphite.

7. An electrically conductive material comprising a ternary intercalation compound of a graphite with a metal fluoride and fluorine represented by the formula

$$C_xF(MF_2)_y$$

wherein M is a metal selected from the group consisting of Pb, transition elements, alkaline earth metals exclusive of Mg and metals in group IIIA of the periodic table exclusive of Al; x is about 1 to about 100; y is about 0.0001 to about 0.15; and z is the valence of M, said metal being one of which the fluoride has a boiling point of about 400° C. or more or one of which the fluoride has a sublimation point of about 400° C. or more.

4,511,494

SOLUTION OF A CHALCOGEN-CONTAINING POLYMER AND PROCESS OF FORMING CONDUCTING POLYMER ARTICLES THEREFROM

Jane E. Frommer, Mendham Township, Morris County; Ronald L. Elsenbaumer, Morristown, and Douglass S. Davidson, Dover, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 432,045, Sep. 30, 1982, Pat. No. 4,452,727, which is a continuation-in-part of Ser. No. 393,010, Jun. 28, 1982, abandoned. This application Mar. 8, 1984, Ser. No. 587,720
Int. Cl.³ H01B 1/06
U.S. Cl. 252—518 **8 Claims**

1. The process of forming a conductive article which comprises the steps:

(a) forming a solution comprising a solvent selected from the group consisting of arsenic trifluoride, arsenic trichloride, arsenic tribromide, phosphorus trifluoride, phosphorus pentafluoride, phosphorus trichloride, phosphorus oxytrichloride, titanium tetrachloride, boron trifluoride, boron trichloride, boron tribromide, antimony trichloride, and antimony pentachloride, a polymer solute comprising aromatic moieties directly linked by divalent, trivalent or tetravalent sulfur or by divalent oxygen and a dopant solute comprising a halide or oxyhalide anion of a group IIIA, IIIB, IVA, IVB, VA, VB, VIIIA or VIB metal or metalloid or of phosphorus, selenium, boron or sulfur; and

(b) removing from the solution the solvent as the polymer solute solidifies.

4,511,495

TUMBLE DRYER PRODUCTS FOR DEPOSITING PERFUME

James B. Melville, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 28, 1981, Ser. No. 258,253
Claims priority, application United Kingdom, May 16, 1980, 8016244
Int. Cl.³ A61K 7/46; B05D 3/12
U.S. Cl. 252—522 A **6 Claims**

1. A method of depositing perfume on fabrics in a rotary hot air dryer in which a perfume-containing fabric conditioning composition is placed in the dryer before, simultaneously with, or after the addition of wet fabrics to the dryer and the dryer is then operated to dry the fabrics, characterised in that said fabric conditioning composition comprises

(i) a first phase constituting from about 0.5% to about 50% by weight of the composition and consisting of particles having an average size of from about 0.1 micron to about 200 microns, the particles comprising an intimate mixture of (a) from about 0.5% to about 50% by weight, based on the weight of the particles, of a perfume, and (b) from about 50% to about 99.5% by weight, based on the weight

of the particles of a matrix comprising at least one water dispersible amine of the formula

$$R—N\,R^1R^2$$

where R is an alkyl or alkenyl group having from 8 to 22 carbon atoms, R^1 is hydrogen or an alkyl or alkenyl group having 1 to 4 carbon atoms and R^2 is hydrogen or an alkyl, alkenyl or amino-alkyl group having from 1 to 22 carbon atoms, the matrix containing no added cationic material; and

(ii) a second phase constituting from about 0.5% to about 80% by weight of the composition and comprising a fabric conditioning agent.

6. A product for depositing perfume on fabrics in a rotary hot air dryer, comprising a fabric conditioning composition supported on a flexible substrate, characterised in that said fabric conditioning composition comprises

(i) a first phase constituting from about 0.5% to about 50% by weight of the composition and consisting of particles having an average size of from about 0.1 micron to about 200 microns, the particles comprising an intimate mixture of (a) from about 0.5% to about 50% by weight, based on the weight of the particles, of a perfume, and (b) from about 50% to about 99.5% by weight, based on the weight of the particles of a matrix comprising at least one water dispersible amine of the formula

$$R—N\,R^1R^2$$

where R is an alkyl or alkenyl group having from 8 to 22 carbon atoms, R^1 is hydrogen or an alkyl or alkenyl group having 1 to 4 carbon atoms and R^2 is hydrogen or an alkyl, alkenyl or amino-alkyl group having from 1 to 22 carbon atoms, the matrix containing no added cationic material; and

(ii) a second phase constituting from about 0.5% to about 80% by weight of the composition and comprising a fabric conditioning agent.

4,511,496

SLOW-RELEASE PERFUME COMPOSITIONS AND A PROCESS FOR THE PREPARATION OF THEM

Yuuichi Matsumoto, Abiko, Japan, assignor to Soda Aromatic Company, Limited, Tokyo, Japan

Filed Jun. 14, 1983, Ser. No. 504,226

Claims priority, application Japan, Jun. 22, 1982, 57-106111

Int. Cl.³ A61K *7/46*

U.S. Cl. 252—522 A **12 Claims**

1. A slow-release perfume composition comprising a pellet of an ethylene-vinyl acetate copolymer having a vinyl acetate content in the range of from 19 to 40% by weight, said pellet having a particle size in the range of about 1 to 10 mm, said pellet being impregnated with a perfume, said perfume containing as an essential component at least one fragrant component selected from the group consisting of hydrocarbons and esters, a fine powder being coated over the surface of said perfume-impregnated pellet and being present in an amount sufficient to coat the pellet surface thereof, and said fine powder being insoluble in either said pellet or said perfume.

4,511,497

BUBBLE COMPOSITION USING MULTIPURPOSE SURFACTANT BASE

Joseph R. Ehrlich, New York, N.Y., assignor to Strombecker Corporation, Chicago, Ill.

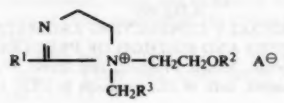
Continuation of Ser. No. 320,518, Nov. 12, 1981, abandoned.

This application Sep. 28, 1983, Ser. No. 536,881

Int. Cl.³ C11D *1/84, 3/22*

U.S. Cl. 252—542 **10 Claims**

1. A bubble-forming composition, which consists essentially of an aqueous solution consisting essentially of from about 0.1 to about 5% by weight of a cellulose ether selected from the group consisting of hydroxypropyl methylcellulose and hydroxybutyl methylcellulose and mixtures thereof and from about 0.8 to about 15% by weight of an imidazoline surfactant of formula II:



(II)

wherein:

R^1 is an alkyl or alkenyl group derived from a fatty acid;

R^2 is hydrogen, $—CH_2COOM$, $—CH_2CH_2COOM$ or M;

R^3 is $—COOM$, $—CH_2COOM$ or $CHOHCH_2SO_3M$;

M is hydrogen, alkali metal or ammonium; and

A is hydroxy, chloride or sulfate or surface active sulfonate or sulfate.

4,511,498

MIXED PHENYL/MESITYL PHOSPHATE ESTER COMPOSITION

Fui-Tseng H. Lee, Princeton; Charles V. Juelke, Belle Mead, and Joseph H. Finley, Metuchen, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 348,636, Feb. 16, 1982, Pat. No. 4,446,062.

This application Dec. 2, 1983, Ser. No. 557,706

Int. Cl.³ C09K *3/28*

U.S. Cl. 252—609 **2 Claims**

1. A mixed phosphate ester composition useful as a fire retardant additive, comprising about 20 weight percent triphenyl phosphate, about 40 weight percent diphenyl mesityl phosphate, about 40 weight percent phenyl dimesityl phosphate, said mixed ester composition having a viscosity at 65.6° C. no greater than about 0.000024 meter² per second and having a phosphorus analyses of from about 8.2% to about 8.4%.

4,511,499

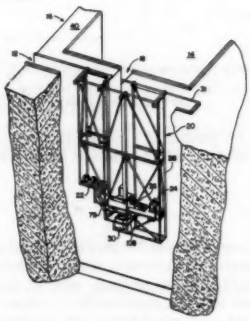
APPARATUS FOR DISMANTLING AND DISPOSING OF FUEL ASSEMBLIES

Robert E. Meuschke, Penn Hills, and Joseph R. Schulties, Gibsonia, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 18, 1982, Ser. No. 359,552

Int. Cl.³ G21F *9/34*

U.S. Cl. 252—626 **3 Claims**



1. Apparatus for dismantling, shearing, and compacting an elongated fuel assembly frame skeleton remaining after removal of a top nozzle and fuel rods of a nuclear fuel assembly, comprising:

a superstructure adapted for positioning, substantially underwater, in a transfer canal of a fuel handling building of a

nuclear power generating facility, adjacent to a spent fuel pit contained therein;

bottom nozzle removal operating means contained within the superstructure supported at a level below the surface water level of the transfer canal, the bottom nozzle removal operating means including a guillotine blade for severing a bottom nozzle from thimble tubes and grids of the fuel assembly frame skeleton;

compactor operating means supported within said superstructure at a level below the surface of the water level of the transfer canal for compacting the remainder of the frame skeleton after the bottom nozzle has been removed and prior to shearing thereof, to a width which is substantially less than the original width in cross-section in a directional orthogonal to the longitudinal axis of the frame skeleton;

skeleton shear operating means supported by said superstructure below the surface level of the water in the transfer canal for shearing the compacted skeleton into pieces of a shorter length than the original length in the longitudinal direction;

conveyor means operatively associated with said superstructure, the spent fuel pit and the transfer canal for conveying the frame skeleton from the fuel pit to said superstructure after the top nozzle and the fuel rods are removed in the fuel pit from the fuel assembly, said conveyor means also cooperating with the bottom nozzle removal operating means, the compactor operating means and the shear operating means for transferring the frame skeleton from one of the aforementioned operating means to another;

a transfer container for receiving the severed bottom nozzle and sheared sections of the frame skeleton assembly;

a first chute connected between the bottom nozzle removal operating means and the transfer container for transferring the severed bottom nozzle to the transfer container; and

a second chute connected between the skeleton shear operating means and the transfer container for transferring the severed sheared skeleton sections to the transfer container.

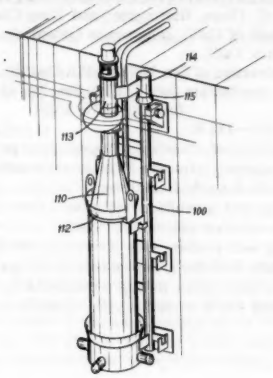
4,511,500

METHOD AND DEVICES FOR PRODUCING EXCHANGES IN RESERVOIRS USED FOR STORING RADIOACTIVE MATERIALS

René Guilloteau, Verriers Le Buisson, France, assignor to Societe Generale pour les Techniques Nouvelles, S.G.N., Montigny-Le-Bretonneux, France

Continuation-in-part of Ser. No. 162,947, Jun. 25, 1980, abandoned. This application Feb. 10, 1983, Ser. No. 465,504
Claims priority, application France, Jul. 2, 1979, 79 17159
Int. Cl.³ G21F *9/12*
U.S. Cl. 252—633 **9 Claims**

1. In a pool type storage system for radioactive waste including a reservoir having bottom and side walls and an open top, water in said reservoir to a predetermined level along said side walls, and radioactive waste submerged within said water; the combination therewith of means positioned directly within said reservoir and submerged within said water for effecting desired exchanges on said water, said exchange means comprising at least one autonomous, dismountable, multi-section, generally vertically oriented, exchange unit having means for allowing the flow of said water therethrough and including a base section detachably positioned on said bottom wa¹l of said reservoir and having receiving means on the upper end thereof, an exchange section having the lower end thereof detachably positioned on said receiving means of said base section and having a receiving means on the upper end thereof and including means therewithin for effecting an exchange on said water, and a pump section having the lower end thereof detachably positioned on said receiving means of said exchange section and including pump means for at least initiating the flow of said water through said exchange unit.



4,511,501

BIS-AMIDE DISULFIDE CLEAVABLE CROSS-LINKING REAGENTS

Richard F. Luduena, San Antonio, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Division of Ser. No. 417,026, Sep. 13, 1982,. This application Nov. 14, 1983, Ser. No. 551,586
Int. Cl.³ C07G *7/00*
U.S. Cl. 260—112 R **6 Claims**

1. A method of selectively establishing a cleavable cross-link between sulfhydryl groups present on a protein substrate molecule comprising:

reacting the sulfhydryl groups with a disulfide compound represented by the formula:

$$X-R_1-\overset{O}{\overset{\|}{C}}-NH-R-S-S-R-NH-\overset{O}{\overset{\|}{C}}-R_1-X$$

wherein R and R_1 are lower alkyl or lower alkenyl groups having one to four carbon atoms, and X is a halide.

4,511,502

PURIFICATION AND ACTIVITY ASSURANCE OF PRECIPITATED HETEROLOGOUS PROTEINS

Stuart E. Builder, Belmont, and John R. Ogez, San Mateo, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 452,355, Dec. 22, 1982,. This application Jun. 1, 1984, Ser. No. 615,676
Int. Cl.³ C07G *7/00*
U.S. Cl. 260—112 R **12 Claims**

1. A process for purifying heterologous proteins which are expressed and deposited in insoluble, refractile form in a host cell culture, which process includes the steps of:

(a) isolating said insoluble refractile heterologous protein from said host cell culture;

(b) dissolving the isolated refractile heterologous protein in a strong denaturing solution; followed by

(c) removing high molecular weight impurities using a molecular sieve or high speed centrifugation techniques.

4,511,503
PURIFICATION AND ACTIVITY ASSURANCE OF PRECIPITATED HETEROLOGOUS PROTEINS

Kenneth C. Olson, Burlingame, and Rong-Chang Pai, Foster City, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 452,252, Dec. 22, 1982,. This application Jun. 1, 1984, Ser. No. 615,680

Int. Cl.³ C07G *7/00*

U.S. Cl. 260—112 R **2 Claims**

1. A method of solubilizing heterologous protein, produced in an insoluble "refractile form in a recombinant host cell culture, which method comprises:

isolating and insoluble "refractile" heterologous protein from said host cell culture, and

treating said protein with a strongly denaturing solution selected from the group consisting of a guanidine salt or a salt of thiocyanate having a concentration between about 4M and 9M to solubilize said refractile protein.

4,511,504
CARBOXYALKYL PEPTIDE DERIVATIVES

Keith G. McCullagh, Princes Risborough; Harry J. Wadsworth, High Wycombe, and Michael M. Hann, Watlington, all of England, assignors to G.D. Searle & Co., Skokie, Ill.

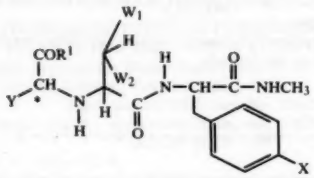
Filed Apr. 12, 1984, Ser. No. 599,307

Claims priority, application United Kingdom, Apr. 26, 1983, 8311286

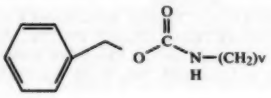
Int. Cl.³ C07C *103/52;* **A61K** *37/00;* **A01N** *43/42, 43/36*

U.S. Cl. 260—112.5 R **12 Claims**

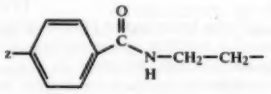
1. A compound of the formula



and the pharmaceutically acceptable acid addition salts thereof wherein x represents hydrogen, alkoxy or benzyloxy; y represents a radical selected from alkyl, alkylthioalkyl,



wherein v is 2 or 3,



wherein z represents hydrogen or nitro; W_1 and W_2 represent methyl or trifluoromethyl; and R^1 represents hydroxy or alkoxy and the stereochemistry of the carbon marked by the asterisk is R.

4,511,505
SEMI-SYNTHESIS OF HUMAN INSULIN

Kazuyuki Morihara; Tatsushi Oka, and Hiroshige Tsuzuki, all of Osaka, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 336,071, Dec. 31, 1981, Pat. No. 4,400,465, which is a division of Ser. No. 138,514, Apr. 9, 1900, Pat. No. 4,320,196. This application Jun. 3, 1983, Ser. No. 500,915

Claims priority, application Japan, Apr. 13, 1979, 54-45710

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.7 **3 Claims**

1. A protected human insulin, namely B30-Thr(R^1)(R^2)-human insulin wherein Thr is an L-threonine residue, R^1 is hydrogen or a hydroxy-protecting group, and R^2 is alkyl as a carboxyl-protecting group, and wherein R^2, or R^1 and R^2, are the only protecting groups in the protected human insulin.

4,511,506
REACTIVE BIS-TRIAZINYL STILBENE DYES

Hans Baumann, and Hermann Kaack, both of Wachenheim, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

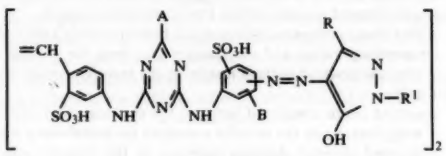
Filed Jan. 2, 1979, Ser. No. 172

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1978, 28001470

Int. Cl.³ C09B *62/08*

U.S. Cl. 534—631 **4 Claims**

1. A reactive dye in free acid or salt form which in the form of the free acid corresponds to the general formula:



where

A is fluorine or chlorine,

B is hydrogen, chlorine, methyl, methoxy, ethoxy, hydroxysulfonyl or carboxyl,

R is carboxyl, C_1–C_4-alkoxycarbonyl, carbamyl, N-mono- or N,N-di-C_1–C_4-alkyl- or -hydroxyalkyl-substituted carbamyl, carbopiperidide, carbopyrrolidide or carbomorpholide and

R^1 is C_1–C_4-alkyl which is unsubstituted or substituted by cyano, hydroxyl or carboxyl, phenyl which is unsubstituted or substituted by methyl, ethyl, fluorine, chlorine, bromine, amino, trifluoromethyl, methoxy, ethoxy, cyano, phenoxy, acetyl, methylsulfonyl, benzoyl, phenylsulfonyl, acetylamino, nitro, hydroxyl, carboxyl, carbamyl, 2-benzthiazolyl or sulfamyl, or naphthyl which is unsubstituted or substituted by hydroxysulfonyl.

4,511,507
MONOAZO COMPOUND HAVING BOTH MONOCHLOROTRIAZINYL AND VINYLSULFONE TYPE REACTIVE GROUPS

Yutaka Kayane, Moriguchi; Takashi Omura, Ashiya; Katsumasa Otake, Nara, and Akira Takeshita, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

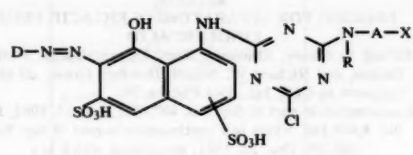
Filed Dec. 20, 1983, Ser. No. 563,587

Claims priority, application Japan, Dec. 28, 1982, 57-231040

Int. Cl.³ C09B *62/08;* **D06P** *3/10*

U.S. Cl. 534—629 **5 Claims**

1. A compound represented by a free acid of the formula,



wherein D is a phenyl group substituted with one to three substitutents selected from the group consisting of halogen atoms and methyl, ethyl, methoxy, ethoxy, acetylamino, propionylamino, sulfo and carboxyl groups, R is a C_1 to C_4 alkyl group unsubstituted or substituted with a halogen atom or a hydroxyl, cyano, alkoxy, carboxyl, carbamoyl, alkoxycarbonyl or sulfo group, A is a phenylene group unsubstituted or substituted with one or two substituents selected from the group consisting of methyl, ethyl, methoxy, ethoxy and sulfo groups and chlorine and bromine atoms, or a naphthylene group unsubstituted or substituted with one sulfo group, and X is $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Y$ in which Y is a group capable of being split by the action of an alkali.

4,511,508

PROCESS FOR DRYING OF NATURAL EXTRACTS PREPARED BY HIGH PRESSURE EXTRACTION

Heinz-Rüdiger Vollbrecht, Stein; Erwin Schütz, Palling, and Klaus Sandner, Trostberg, all of Fed. Rep. of Germany, assignors to SKW Trostberg AG, Trostberg, Fed. Rep. of Germany

Filed Apr. 27, 1982, Ser. No. 372,414

Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3118160

Int. Cl.³ C07G *17/00*

U.S. Cl. 426—665 **8 Claims**

1. A process for drying extracts of plant or plant part origin obtained by high-pressure extraction with liquefied gases or gases in the supercritical state whereafter the extract is recovered from the gas stream, wherein the improvement comprises the step of removing moisture from the gas stream laden with the extract, before recovering the extract.

4,511,509

3-ALKYLIDINE AZETIDINE COMPOUND AND THEIR PRODUCTION

Hamao Umezawa, Tokyo; Masaji Oono, Kamakura; Hiroshi Ishihama, Higashi-Murayama; Yoshinori Kyotani, Higashi-Yamato, and Yoshio Takahashi, Higashi-Murayama, all of Japan, assignors to Kowa Co., Ltd., Nagoya-chi, Japan

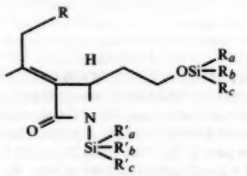
Filed Mar. 21, 1983, Ser. No. 477,369

Claims priority, application Japan, Mar. 25, 1982, 57-47829; May 14, 1982, 57-81195

Int. Cl.³ C07F *7/18*; C07D *205/08, 487/04*; A61K *31/40*

U.S. Cl. 260—239 A **1 Claim**

1. An azetidine compound of the formula



wherein R represents a hydroxyl group, and R'_a, R_b, R_c, R'_a, R'_b and R'_c are identical or different and each represent a lower alkyl group.

4,511,510

PROCESS FOR PREPARING A 7-CHLORO-5-(2-CHLOROPHENYL)-BENZODIAZEPINONE

Francesco Mauri, Monza, Italy, assignor to Ravizza S.p.A., Milan, Italy

Filed Oct. 18, 1978, Ser. No. 952,397

Claims priority, application Italy, Oct. 18, 1977, 28738 A/77

Int. Cl.³ C07D *243/32*

U.S. Cl. 260—239.3 D **4 Claims**

1. A method for preparing 7-chloro-5-(2-chlorophenyl)-1,3-dihydro-2H-1,4-benzodiazepin-2-one in a single passage and in a single reaction medium, without the separation of intermediate compounds, which comprises refluxing a suspension of phthalimidoglycine in chloroform with thionyl chloride until a clear solution forms; first adding to said clear solution 2',5-dichloro-2-amino-benzophenone and, thereafter, adding ethanol, chloroform and hydrazine hydrate under ambient temperature conditions to obtain the desired product, the ratio by weight of 2',5-dichloro-1-aminobenzophenone to chloroform to ethanol being 1:15–16:4–5, and the molar ratio of 2',5-dichloro-2-aminobenzophenone to hydrazine being approximately 1:2.

4,511,511

PREDNISOLONE DERIVATIVES

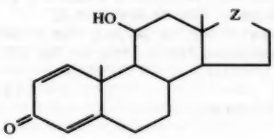
Marvin L. Lewbart, Media, Pa., assignor to Crozer-Chester Medical Center, Chester, Pa.

Filed Dec. 15, 1982, Ser. No. 450,155

Int. Cl.³ C07J *5/00*

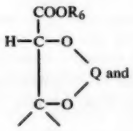
U.S. Cl. 260—239.55 D **12 Claims**

1. A compound of the formula (I)

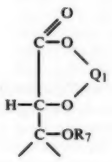


(I)

wherein Z is selected from the group consisting of:



(IIB)



(IIC)

wherein R_6 is selected from the group consisting of hydrogen and lower alkyl, R_7 is selected from the group consisting of hydrogen, lower alkyl and lower acyl; wherein Q and Q_1 are selected from the group consisting of:

wherein X is O or S,

and $-CH_2)_n$

wherein each of R_8 and R_9 is independently selected from the group consistency of hydrogen, lower alkyl, aryl, arylalkyl, alkanoyl and aryl and n is an integer from 2 to 10.

4,511,512

SUBSTANTIALLY PURE DICYCLOHEXYL AMMONIUM 6-β-BROMO-PENICILLANATE

Welf von Daehne, Rungsted Kyst, Denmark, assignor to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Produktionsaktienselskab), Ballerup, Denmark

Filed May 1, 1980, Ser. No. 145,880

Int. Cl.³ C07D *499/00;* A61K *31/425*

U.S. Cl. 260—245.2 R **1 Claim**

1. Substantially pure dicyclohexylammonium 6β-bromopenicillanate.

4,511,513

DETERGENT COMPOUNDS AND COMPOSITIONS

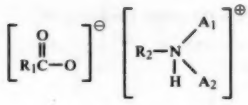
Jacob J. Guth, Upper Black Eddy, Pa., and Robert J. Verdicchio, Succasunna, N.J., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Continuation-in-part of Ser. No. 241,862, Mar. 9, 1981, abandoned. This application May 5, 1982, Ser. No. 375,073

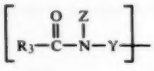
Int. Cl.³ C11D *1/52;* C07C *103/54*

U.S. Cl. 260—404.5 **5 Claims**

1. A complex of the formula



wherein R_1 is alkyl containing from about 5 to 17 carbon atoms and mixtures thereof; R_2 is alkyl amido of the formula



wherein R_3 is alkyl containing from about 5 to 17 carbon atoms and mixtures thereof; Z is H or lower alkyl containing from 1 to 4 carbon atoms; and Y is alkylene containing from 2 to 4 carbon atoms;

A_1 and A_2 are the same or different and at least one of A_1 and A_2 are selected from the group of anionic salt moieties consisting of

$-CH_2CH_2-COOX]_n$

$-CH_2-COOX]_n$

wherein X is a water soluble cation and n is an integer of 1 or 2 with the proviso that if only one of A_1 and A_2 are selected from the anionic salt moieties above, the other is lower alkyl or lower hydroxyalkyl containing from 1 to 4 carbon atoms.

4,511,514

PROCESS FOR SEPARATING OLEIC ACID FROM LINOLEIC ACID

Michael T. Cleary, Elmhurst; Santi Kulprathipanja, Hoffman Estates, and Richard W. Neuzil, Downers Grove, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 407,672, Aug. 12, 1982, Pat. No. 4,404,145, which is a continuation-in-part of Ser. No. 333,250, Dec. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 297,453, Aug. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 252,745, Apr. 10, 1981, Pat. No. 4,329,280. This application Oct. 18, 1982, Ser. No. 435,134

Int. Cl.³ C11B *3/16*

U.S. Cl. 260—419 **19 Claims**

1. A process for separating oleic acid from linoleic acid contained in a feed mixture comprising said acids, said process comprising contacting said feed mixture at separation conditions with a molecular sieve comprising silicalite, thereby selectively retaining said oleic acid, and removing linoleic acid from the oleic acid containing molecular sieve.

4,511,515

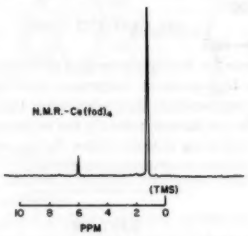
METHOD FOR MAKING A VOLATILE CERIUM DIKETONATE COMPOUND

David A. Thompson, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jun. 28, 1983, Ser. No. 508,602

Int. Cl.³ C07F *5/00*

U.S. Cl. 260—429.2 **3 Claims**



1. A process for the synthesis of tetrakis-(6,6,7,7,8,8,8-heptafluoro-2,2-dimethyl-3,5-octanedione) cerium (IV) which comprises the steps of:

(a) preparing an aqueous solution of a soluble cerium (IV) salt, to provide a cerium (IV) solution; and

(b) combining the cerium (IV) solution with deprotonated 6,6,7,7,8,8,8-heptafluoro-2,2-dimethyl-3,5-octanedione to react the octanedione with the cerium (IV), and to thereby yield a tetrakis-(6,6,7,7,8,8,8-heptafluoro-2,2-dimethyl-3,5-octanedione) cerium (IV) product.

4,511,516

BORON CONTAINING HETEROCYCLIC COMPOUNDS

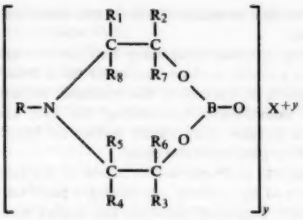
Richard A. Holstedt, Whittier; Kenneth Baron, Diamond Bar, and Peter Jessup, Santa Ana, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 158,828, Jun. 12, 1980, Pat. No. 4,400,284, and a continuation-in-part of Ser. No. 158,981, Jun. 12, 1980,. This application Sep. 15, 1982, Ser. No. 418,196

Int. Cl.³ C07F *5/04;* C10M *3/48*

U.S. Cl. 260—462 R **24 Claims**

1. A compound having the formula:



where R is hydrogen or an alkyl, alkene, alkadiene, aryl, alkylaryl or arylalkyl radical having from 1 to about 24 carbon atoms, R_1 and R_4 are the same or different radicals selected from hydrogen or alkyl, aryl, alkylaryl or arylalkyl radicals or a mixture thereof, said radicals having from 1 to about 30 carbon atoms, R_2 and R_3 are the same or different aryl, alkylaryl or arylalkyl radicals having from about 6 to about 30 carbon atoms, R_5, R_6, R_7, and R_8 are the same or different radicals selected from hydrogen or an alkyl radical having from 1 to about 6 carbon atoms, Y is an integer between 1 and 4, and X is hydrogen or a metal selected from a transition metal having an atomic number of 21 through 30 or a Group IVA metal.

4,511,517
CARBONYLATION OF METHYL ACETATE

Jean Gauthier-Lafaye, Lyons; Robert Perron, Charly, and Claude Doussain, Saint-Fons, all of France, assignors to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Jul. 16, 1982, Ser. No. 398,802
Claims priority, application France, Jul. 17, 1981, 81 14123
Int. Cl.³ C07C *51/56*
U.S. Cl. 260—549 **20 Claims**

1. In a process for the carbonylation of methyl acetate to produce acetic ahydride in homogeneous liquid phase, the improvement which comprises conducting such carbonylation at a temperature from 80° to 240° C. and under a total pressure from 20 to 300 bars in a virtually anhydrous medium in the presence of:

(a) a cobalt source;

(b) a source of iron in the zero oxidation state;

(c) an ionic iodide of the formula:

$$A^+I^-$$

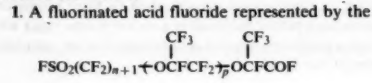
in which A^+ is a nitrogen group quaternary onium cation or an alkali metal cation, the molar ratio I^-/Co being greater than or equal to 10; with the total amount of halogen compounds present in the reaction medium, expressed in gram atoms of halogen and designated as X_T, being such that the atomic ratio $X_T/(A+)$ is less than or equal to 1.

4,511,518
PERFLUORINATED FLUOROSULFONYLALKYLENEOXY-2-PROPANOYL FLUORIDE AND HEXAFLUOROEPOXIDE ADDITION COMPOUNDS

Kyoji Kimoto; Hirotsugu Miyauchi; Jukichi Ohmura; Mikio Ebisawa, and Toshioki Hane, all of Kanagawa, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 330,608, Dec. 14, 1981, which is a division of Ser. No. 152,856, May 23, 1980, Pat. No. 4,329,435. This application Aug. 30, 1983, Ser. No. 527,818
Claims priority, application Japan, May 31, 1979, 54-67889; Jul. 18, 1979, 54-90302; Dec. 21, 1979, 54-165675; Dec. 26, 1979, 54-168179; Dec. 28, 1979, 54-170315
Int. Cl.³ C07C *143/70*
U.S. Cl. 260—543 F **3 Claims**

1. A fluorinated acid fluoride represented by the formula:

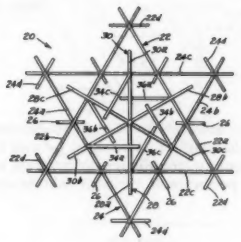


wherein n is an integer of 2 to 4 and p is an integer of 0 to 50.

4,511,519
TOWER PACKING ELEMENTS

Min A. Hsia, Kent, Ohio, assignor to Norton Company, Worcester, Mass.

Filed Apr. 30, 1984, Ser. No. 605,044
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—94 **19 Claims**



1. A packing element for fluid-fluid contact apparatus comprising:

a first hollow triangular shape structure on one side of the packing element and a central plane thereof extending perpendicular to a central axis of the packing element having

three relatively thin narrow elongated inclined structural side members inclined relative to each other and the central plane, extending around the central axis and between apexes of the first triangular structure;

a second hollow triangular shape structure on an opposite side of the packing element and the central plane and angularly displaced about the central axis relative to the first triangular structure and having

three relatively thin narrow elongated inclined structural side members inclined relative to each other, the central plane and the inclined side members of the first triangular structure and extending around the central axis between apexes thereof and crossing the inclined side members of the first triangular structure; and

a pair of interconnected generally Y-shape structures each situated on one side of the central plane and the packing element, adjacent each of the first and second triangular structures and each including

a central hub about the central axis, and

three relatively thin narrow elongated radial structural members angularly displaced relative to each other about the central axis, extending radially from the central hub, connected to and crossing outer inclined edges of the three structural side members of each adjacent one of the first and second triangular structures to free drip ends thereof each situated within an open ended cell adjacent each of the apexes.

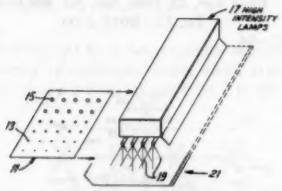
4,511,520
METHOD OF MAKING PERFORATED FILMS

William E. Bowen, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Jul. 28, 1982, Ser. No. 402,759
Int. Cl.³ B29C *17/08*
U.S. Cl. 264—22 **17 Claims**

1. A method of producing a perforated plastic film for passage of fluid therethrough which comprising forming a pattern of light-absorbing material on spaced finite areas on one surface of said plastic film, subjecting said plastic film to a light source and causing light generated from said light source to be absorbed by said light-absorbing material thereby melting the plastic film at the areas covered by said light-absorbing material without melting the remaining areas in said plastic film and producing perforations through said film at said areas.

17. A method of producing a perforated plastic film for passage of fluid therethrough which comprises forming a pattern of light-absorbing material on spaced finite areas on a surface of a first plastic film, laminating a second plastic film onto said surface and subjecting the resulting laminate to a



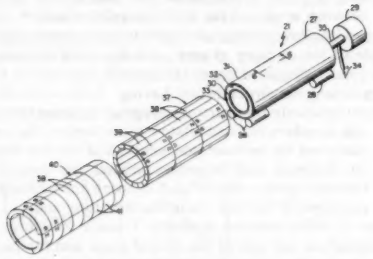
light source to be absorbed by said light-absorbing material thereby melting the plastic film covered by said light-absorbing material without melting the remaining areas in the plastic film to produce perforations through said laminate at said areas.

4,511,521

ENDLESS POWER TRANSMISSION BELT CONSTRUCTION AND METHOD AND APPARATUS FOR MAKING THE SAME

Paul M. Standley, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Apr. 12, 1982, Ser. No. 367,520
Int. Cl.³ B29D *29/02*
U.S. Cl. 264—24 **15 Claims**



1. In a method of making an endless power transmission belt construction or the like formed of material that is mainly polymeric material and that has been cut from an annular belt sleeve, the method comprising the steps of forming a tension section, forming a compression section, forming a load-carrying section intermediate said tension section and said compression section, and orienting at least part of the material of at least one of said sections, the improvement wherein said step of orienting comprises the step of orienting said part of said material by the force of field line means imposed thereon while said material is in liquid form and is in the belt sleeve form thereof.

4,511,522

METHOD OF MAKING A COMPOSITE FOAM TAXIDERMY MANNIKIN INVOLVING THE USE OF A CLEANABLE ADHESIVE TO HOLD THE ARTIFICIAL EYES IN THE MOLD CAVITY

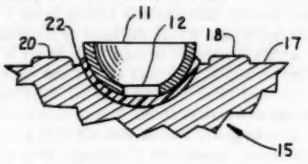
John R. Rinehart, 3232 McCormick Dr., Janesville, Wis. 53545

Continuation of Ser. No. 363,263, Mar. 29, 1982, Pat. No. 4,432,919. This application Jan. 23, 1984, Ser. No. 572,808
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.³ B29D *27/04*
U.S. Cl. 264—46.4 **4 Claims**

1. A method of making a taxidermy animal head mannikin having artificial eyes with pupils properly positioned therein and surrounded immediately by proper anatomical features, comprising:

providing a mold comprising half parts which together define a cavity surface contoured for correct anatomical formation of features of the mannikin including the features immediately surrounding the eye; and two eye socket recesses in the cavity surface for snugly receiving the front portion of the eyes;

inserting into each eye socket recess of the mold the front portion of an artificial eye having a pupil with cleanable adhesive emplaced between the socket recess and the front portion of the eye, leaving the rear portion of the eye projecting into the mold cavity;



orienting each eye as held by the adhesive to a desired position;

closing the half parts together to form the full mold cavity therebetween;

introducing liquid foamable hardenable material into the mold cavity to foam expand and harden, thereby forming the mannikin and locking the eyes into the mannikin in proper position therein;

separating the two half parts of the mold from the formed mannikin; and

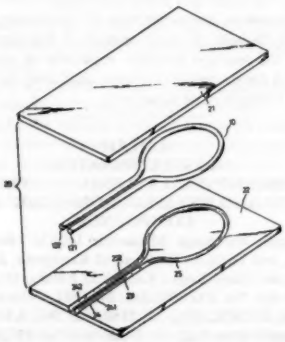
cleaning the adhesive from the eyes embedded in the mannikin.

4,511,523

FABRICATION OF A COMPOSITE MATERIAL RACKET FRAME

Joseph Hsu, No. 306, Chung-Kang Rd., Sec. 1, Taichung, Taiwan

Filed Nov. 16, 1982, Ser. No. 442,092
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—46.6 **7 Claims**



1. A method for producing a reinforced composite racket frame including an outer shell made of a fiber reinforced thermosetting plastic material and a foam core comprising the steps of:

(a) placing an open-ended tubular shell of fiber reinforced thermosetting plastic material in a racket frame mold with two valve members respectively provided at an outlet and an inlet of the mold;

(b) heating the mold to a first predetermined temperature for curing the tubular shell;
(c) causing one of the valve members to be open and the other valve to be closed;
(d) applying compressed air through the open valve to force the shell into intimate contact with an inner surface of the mold, the shell thereby assuming the shape of the mold;
(e) cooling the mold to a second predetermined temperature at which the tubular shell becomes set to the mold shape;
(f) opening the closed valve;
(g) introducing a predetermined amount of a foamable material through at least one of the valves and into the shell;
(h) closing both of the valve members to allow the forming of a foam material at the second predetermined temperature within the tubular shell to form a core of the racket.

4,511,524

CARBON RESISTOR AND METHOD FOR PRODUCING SAME

Joseph Nemeth, Harsens Island, and Charles I. Kowalski, Mt. Clemens, both of Mich., assignors to Champion Spark Plug Company, Toledo, Ohio

Continuation of Ser. No. 236,785, Feb. 23, 1981, abandoned. This application Nov. 8, 1982, Ser. No. 440,174

Int. Cl.³ H01C *13/00*

U.S. Cl. 264—61 **3 Claims**

1. A method for producing a ceramic resistor, said method comprising the steps of preparing a uniform, finely-divided mixture by blending a glass frit with at least one temporary binder, and from ¼ to 4 parts conductive carbon, pressing a longitudinally extending shape having opposed ends from the mixture, applying a silver paint to the opposed ends and firing the shape to vitrify the frit of the resistor, and wherein the silver paint consists essentially of a silver metal powder, a lead borosilicate frit and a solvent, and from 15 percent to 75 percent, based upon the paint solids, of a frit composition which consists essentially of from 15 to 30 percent of a phenyl lower alkyl silicone resin, from 5 to 15 percent of $AlPO_4$, from ¼ to 3 percent of conductive carbon, and from 65 to 80 percent of a lead borosilicate glass frit consisting essentially of substantially 20 percent SiO_2, 15 percent B_2O_3, 59 percent PbO and 6 percent Na_2O.

4,511,525

PROCESS FOR PRODUCING SINTERED SILICON NITRIDE-BASE BODY

Akihiko Tsuge; Michiyasu Komatsu, both of Yokohama; Hiroshi Inoue, Kawaguchi, and Katsutoshi Komeya, Oiso, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 22, 1982, Ser. No. 443,678

Claims priority, application Japan, Nov. 26, 1981, 56-188455; Nov. 30, 1981, 56-192365

Int. Cl.³ C04B *35/58*

U.S. Cl. 264—65 **7 Claims**

1. A process for producing a sintered silicon nitride-base body, comprising the steps of:
producing a powdery mixture (B) comprising silicon nitride and a sintering additive;
heat treating said powdery mixture (B) at a temperature ranging from about 1450° to 1750° C. in a non-oxidizing atmosphere;
grinding said heat-treated mixture into a powder;
heat treating a powder (A) consisting essentially of silicon nitride at a temperature ranging from about 1450° to 1800° C. in a non-oxidizing atmosphere;
mixing said heat-treated powdery mixture (B) and said heat-treated powder (A) to form a product powdery mixture;
forming said product powdery mixture into a desired shape; and
sintering said formed product powdery mixture in a non-oxidizing atmosphere.

4,511,526

METHOD FOR MAKING WEATHERSTRIPPING HAVING A ROUGH, LOW-FRICTION SURFACE

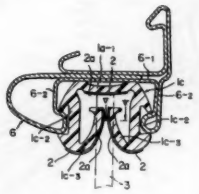
Toshiaki Yamaguchi, Chiba, Japan, assignor to Kinugawa Rubber Industrial Co., Ltd., Japan

Division of Ser. No. 370,675, Apr. 22, 1982, Pat. No. 4,442,156. This application Feb. 17, 1983, Ser. No. 467,290

Claims priority, application Japan, Apr. 23, 1981, 56-61624; Apr. 23, 1981, 56-61625; Apr. 23, 1981, 56-61626; Jun. 16, 1981, 56-88441[U]; Jun. 16, 1981, 56-88442[U]

Int. Cl.³ B29H *7/00;* **B29C** *3/00*

U.S. Cl. 264—129 **8 Claims**



1. A method of manufacturing window weather stripping having a rough surface for sealing a gap between a movable glass and a window frame, which comprises the following steps of:
(1) extrusion-molding a rubber material into the shape of window weather stripping;
(2) vulcanizing the extrusion-molded rubber material to form a vulcanized rubber material;
(3) applying a paint consisting essentially of nylon particles contained in a nylon-based bonding agent onto at least one sliding surface of the vulcanized rubber material so that the nylon particles form at least one rough surface;
(4) drying the paint-containing nylon particles; and
(5) baking the dried paint.

4,511,527

ALKALI METAL SALTS OF CROSS-LINKED POLYMERIC MICROGELS AS NUCLEATING AGENTS FOR POLYETHYLENE TEREPHTHALATE MOLDING COMPOSITIONS AND METHOD FOR MOLDING

Thomas J. Dolce, Stirling, N.J., and Bheema R. Vijayendran, Louisville, Ky., assignors to Celanese Corporation, New York, N.Y.

Filed Dec. 16, 1982, Ser. No. 449,886

Int. Cl.³ B29F *1/00*

U.S. Cl. 264—328.2 **20 Claims**

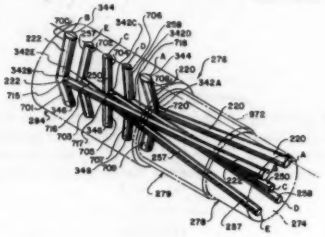
1. A melt blend suitable for use as a thermoplastic molding composition comprised of polyethylene terephthalate and a nucleating agent in an amount sufficient to enhance the crystallization of the polyethylene terephthalate, the nucleating agent being comprised of an alkali metal salt of a cross-linked, aqueous emulsion-polymerized copolymer comprising (1) at least one polymerizable vinyl monomer selected from the group consisting of carboxylic acid group-free polymerizable vinyl monomers and mixtures thereof in an amount sufficient to constitute a major portion of said copolymer; (2) from about 5 to less than 50 percent by weight, based on total monomer weight, of at least one polymerizable vinyl monomer selected from the group consisting of alpha, beta-ethylenically unsaturated carboxylic acid monomers and mixtures thereof, said carboxylic acid monomers being substantially non-gelling when copolymerized with said acid group-free monomers in an aqueous emulsion; and (3) up to about 10 percent by weight, based on total monomer weight of a multifunctional cross-linking monomer; and wherein said nucleating agent is present in an amount sufficient to enable a molded article produced from a melt blend containing 31 weight percent glass fibers to exhibit a heat deflection temperature of at least about 190° C. at a mold temperature of 70° C. as determined by ASTM D648.

4,511,528

FLOW STREAM CHANNEL SPLITTER DEVICES FOR MULTI-COINJECTION NOZZLE INJECTION MOLDING MACHINES

Frederick G. Kudert, Niles; Maurice G. Latreille, Batavia, and William A. Tennant, Schaumburg, all of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Apr. 13, 1983, Ser. No. 484,441
Int. Cl.³ B29C *5/00*; B29D *9/00*; B29F *1/02, 1/10*
U.S. Cl. 264—328.8 **93 Claims**



1. An elongated polymer stream flow channel splitter device for use in a runner block of a multi-coinjection nozzle, injection molding machine, comprised of

a polymer flow stream entrance surface portion,

a plurality of polymer flow stream exit surface portions,

a plurality of spaced polymer stream flow channels extending through a portion of the device, and

a plurality of spaced flow channel entrance ports positioned along the entrance surface portion and communicating with the flow channels, each of said flow channels having a portion which branches at a branch point within the device whereat the flow channel splits into first and second branched exit flow channels of substantially equal length and which communicate with and terminate at respective first and second exit ports each positioned in different exit surface portions, the plurality of first exit ports for the first branched exit flow channels and the plurality of second exit ports for the second branched exit flow channels is each arranged in its own respective axially-aligned spaced pattern of exit ports, for communication with corresponding polymer stream flow channel entrances in a runner block of the multi-coinjection nozzle, injection molding machine.

4,511,529

METHOD OF MAKING A BOTTLE CLOSURE

Thomas A. Fowles, McHenry; Glenn L. Slater, Ingleside, both of Ill., and David A. Winchell, Twin Lakes, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 306,604, Sep. 29, 1981, Pat. No. 4,378,891. This application Feb. 23, 1983, Ser. No. 468,965
Int. Cl.³ B29C *17/07*; B29D *3/00*
U.S. Cl. 264—515 **1 Claim**

1. A method of making a hermetically sealed plastic container with a separate interior closure comprising:

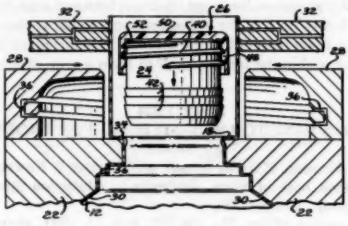
extruding a plastic parison between a pair of movable mold halves defining a body portion of the container and at least a portion of the container neck;

expanding the portion of parison between the mold halves to form the container body and neck portions while holding an upper end of the parison open, forming a thin line of weakness in a horizontal shoulder of the container, above the neck;

providing a preformed generally cylindrical tubular member having threads at an upper end and at least one annular sawtooth notch at the lower end;

attaching a removable primary closure cap, having a top wall and an internally threaded side wall, to the upper end of the preformed tubular member by engaging the internally threaded side wall and the threads at the upper end;

inserting, subsequent to said primary closure cap attachment step, the preformed tubular member with the primary closure cap thereon into the open end of the parison such that the annular sawtooth notch provides fluid-tight engagement with said neck portion to provide a dispensing outlet for the container, said primary closure cap closing the dispensing outlet, said insertion step occurring while



the plastic forming the neck portion is in a soft, semi-molten state; and

sealing the open end of said parison by a second pair of movable molds to hermetically enclose said pre-formed tubular member therewithin;

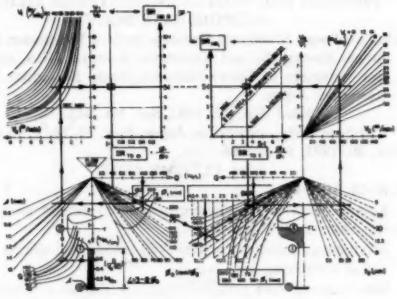
thereby forming, subsequent to said insertion step, an outer removable closure having a generally cylindrical threaded side wall for subsequently installing an internally threaded jacking ring thereon.

4,511,530

PROCESS FOR BLOWING FILM FROM LINEAR THERMOPLASTIC MATERIAL

Stefan Olsson, Gothenburg, and Ralph Widenbäck, Stenungsund, both of Sweden, assignors to Unifos Kemi AB, Stenungsund, Sweden

Filed Oct. 13, 1983, Ser. No. 541,584
Claims priority, application Sweden, Oct. 18, 1982, 8205912
Int. Cl.³ B29D *7/24*
U.S. Cl. 264—564 **16 Claims**



1. A method for the continuous blowing of film from linear polyethylene materials which, after exit of a melt of the thermoplastic material from an annular die accompanied by introduction of air to an interior of the tubular melt thus formed, forms a neck portion having an essentially constant diameter followed at its upper part by rapidly diverging main bubble before solidification at a frost line, the upper part of the neck being defined as the most narrow part or the part where the outward bending has its smallest radius, the improvement comprising,

ejecting the melt from an annular die of a diameter greater than 200 mm and

manipulating the melt temperature, the cooling rate and the take-up speed to

(a) give a linear film velocity (V_1) at the upper part of the neck exceeding 15 m/min., and

(b) give a linear velocity ratio (V_1/V_o), between the velocity of the material at the upper part of the neck portion (V_1) and the velocity of the material when leaving the annular die (V_o), at least as great as the velocity ratio (V_2/V_1), between the final velocity of the material at the frost line (V_2) and the velocity (V_1) at the upper part of the neck portion.

4,511,531

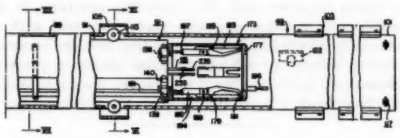
TRANSFER OF NUCLEAR REACTOR COMPONENT ASSEMBLIES

Kenneth J. Swidwa, Harmar Township, Allegheny County; Leonard P. Hornak, North Huntingdon, and Edward F. Kowalski, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 8, 1982, Ser. No. 366,631

Int. Cl.³ G21C *19/10*

U.S. Cl. 376—262 **8 Claims**



1. Apparatus for transferring component assemblies of a nuclear reactor, including fuel assemblies, control-rod assemblies, thimble-plug assemblies, poison assemblies and the like, to and from said nuclear reactor or from one position to another position within said reactor, the said transfer being carried out in a water-filled pit within which the reactor is disposed, the said apparatus including a supporting bridge suspended over said pit, a coordinated assembly supported by said bridge and extending into said pit for engaging and selectively disposing said component assemblies for transfer, and means, connected to said bridge and to said coordinated assembly, for selectively positioning said coordinated assembly to engage and dispose said component assemblies, the said coordinated assembly including an external guiding mast, an inner mast within said guiding mast movable vertically relative to said guiding mast, the said inner mast including means, selectively actuable, to engage and disengage a fuel assembly, means, connected to said engaging-and-disengaging means, for actuating said engaging-and-disengaging means to engage or disengage a fuel assembly, an elongated member within said inner mast vertically movable relative to said inner mast and to said guiding mast, the said elongated member including additional engaging-and-disengaging means for engaging and disengaging those of said component assemblies other than a fuel assembly, means, connected to said additional engaging-and-disengaging means, for actuating said engaging-and-disengaging means to engage or disengage a said other component assembly, drive means, connected to said elongated member, for raising and lowering said elongated member, primary projection means on said elongated member, and means, on said inner mast, selectively actuable between a first position in which it is engageable by said primary projection means to render said drive means operable to raise both said elongated member and said inner mast, and a second position in which said selectively-actuable means is not engageable by said primary projection means to render said drive means operable to raise only said elongated member, whereby with said selectively-actuable means in said first position, said fuel assembly may be raised into said guiding mast and with said selectively-actuable means in said second position, a said component assembly other than said fuel assembly may be raised into said guiding mast.

4,511,532

DEVICE FOR SUPPORTING AND PROTECTING NUCLEAR BOILERS

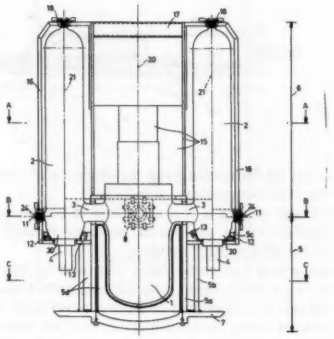
Robert Pièrart, Nantes, France, assignor to Ateliers et Chantiers de Bretagne, A C B, France

Filed Jun. 15, 1979, Ser. No. 48,802

Claims priority, application France, Jun. 23, 1978, 78 20405

Int. Cl.³ G21C *15/12, 13/02*

U.S. Cl. 376—461 **14 Claims**



1. (Amended) Apparatus for supporting and protecting a compact nuclear boiler assembly having a vertical axis and constituted by a nuclear reactor vessel having the same vertical axis as that of said assembly and at least two steam generators symmetrically located around said reactor vessel, each steam generator being connected to the reactor vessel by a short pipe connection which attaches said steam generator to the reactor vessel and permits the interchange of primary coolant between the steam generator and the reactor vessel, said supporting apparatus [comprising] *including* a metallic structure at least partially surrounding the nuclear boiler assembly and supporting the same through the medium of bearing members *and* comprising:

first and second sets of protruding elements *cooperating with ball-joint bearings provided in said structure, at least some of said protruding elements of said first set being* fixed to said reactor vessel and *the other of said protruding elements of said first set being fixed to respective ones of* said steam generators, [the] *said* protruding elements of [a] *said* first set being *substantially* located in [substantially the same] *a common* horizontal plane and having axes which substantially intersect said axis of said reactor vessel and wherein each of the protruding elements of [a] *said* second set is fixed to a respective steam generator *at a distance from said horizontal plane* to extend along [the respective axis thereof] *a substantially vertical direction;* and

wherein said metallic structure [is characterized by] *comprises,*

a rigid lower structure in which ball-joint bearings are provided, said protruding elements of said first set being mounted with a sliding fit in said ball-joint bearings so that the lower structure supports and maintains the boiler assembly through the medium of said protruding elements, said protruding elements being polygonal in cross-section and said ball-joint bearings having a corresponding polygonal bore, each bore comprising two plane bearing surfaces symmetrical in relation to a vertical plane, and

an upper structure forming a cover, rigidly fastened to the lower structure, said upper structure having an outer portion forming walls which [totally] enclose the steam generators to ensure mechanical and radiological shielding of said steam

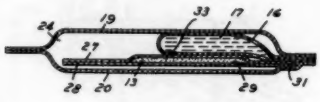
generators, said upper structure holding each steam generator at its upper end by a protruding element of the second set.

4,511,533

TEST KIT FOR PERFORMING A MEDICAL TEST

Philip A. Guadagno, and James R. M. Sanford, both of Vidor, Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Filed Oct. 7, 1982, Ser. No. 433,301
Int. Cl.³ G01N *21/78, 33/72*
U.S. Cl. 422—61 **1 Claim**



1. A test kit for determining the presence of occult blood in fecal material comprising:

a package having a top sheet and a bottom sheet joined together about peripheral portions thereof to form a closed pocket therebetween;

an absorbent pad removeably disposed within the pocket having a first reagent retained within said absorbant pad, and said absorbant pad comprises a top layer of absorbant material being permeable to alcohol or water, a bottom layer of cellulosic material for supporting the top layer, said first reagent being a peroxygen agent disposed in a containment pocket formed between the bottom and top layers;

means for retaining a second reagent disposed in said closed pocket separate from said first reagent; and

said retaining means having a weakened portion being adapted to be ruptured to allow the second reagent to contact the first reagent for activating the absorbant pad, and said retaining means comprising a sealed plastic packet and said weakened portion being a score line formed in the sealed plastic packet located adjacent to the top layer of the absorbant pad and proximate the containment pocket, said second reagent being a solution of guaiac in alcohol, said plastic packet being rupturable at the score line when hand pressure is applied to the package wherein said solution of guaiac in alcohol being absorbed through the top layer of the absorbant pad to activate the peroxygen agent in the containment pocket prior to performing a test using said absorbant pad; and

said sealed plastic packet including an anchoring end which is firmly secured between the top and bottom sheets at a peripheral portion of said package and said absorbant pad including a tab portion which is also secured between the top and bottom sheets at said peripheral portion, and said tab portion including means for permitting removal of said absorbant pad from said package while said plastic packet remains within said package when said absorbant pad is removed.

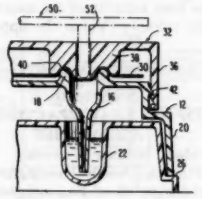
4,511,534

LIQUID TRANSFER DEVICE

John T. Bennett, Jr., 10087 Tyler Pl., Ijamsville, Md. 21754, and Jack E. Goodman, Germantown, Md., assignors to John T. Bennett, Ijamsville, Md.

Filed May 26, 1982, Ser. No. 382,335
Int. Cl.³ B01L *3/02*
U.S. Cl. 422—100 **4 Claims**

1. A liquid transfer device comprising pipette plate means having a plurality of apertures extending therethrough, an upstanding annular boss extending about each aperture on the upper surface of the pipette plate means, a plurality of hollow pipette members secured to the undersurface of said pipette plate means with each hollow pipette member aligned with a respective aperture in said pipette plate means and downwardly extending support means, an elastic membrane covering each aperture in said pipette plate means and disposed in engagement with each upstanding annular boss and retaining plate means having a plurality of pin receiving apertures extending therethrough with a downwardly protruding boss surrounding each aperture in said retaining plate means and means for securing said pipette plate means and said retaining plate means together with the respective apertures in each plate disposed in alignment with each other and with said downwardly protruding bosses extending into the respective upstanding bosses on said pipette plate means to press said membrane into each aperture in said pipette plate means under tension to provide a liquid-tight seal about each aperture.

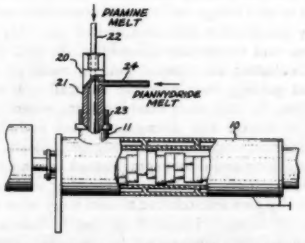


4,511,535

LIQUID MONOMER FEED PIPE FOR CONTINUOUS EXTRUSION POLYMERIZATION

Lawrence R. Schmidt, Schenectady, and Eric M. Lovgren, Westerlo, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 21, 1983, Ser. No. 459,851
Int. Cl.³ B01F *15/02*
U.S. Cl. 422—137 **6 Claims**



1. An apparatus for the polymerization of highly reactive monomers in the liquid state comprising, (A) a feed pipe and (B) a barrel-type extruder reactor, where said feed pipe comprises

(a) a first hollow tube;

(b) a second hollow tube within said first hollow tube and extending below the first hollow tube into a feed region of the barrel of the extruder reactor and

(c) mounting means for positioning said hollow tube on the extruder reactor,

wherein the dimensions of (a) and (b) are sufficient to insure laminar flow of said liquid state monomers into said extruder reactor while satisfying the Reynolds number values in the following expression:

$$Re=[2R(1-\kappa)V\pi]/\mu$$

thereby achieving a Reynolds number of less than 2100, where R is the inner radius of the outer tube, κ is the ratio of the outside diameter of the inner tube to the inside diameter of the outer tube, V is the average fluid velocity, π is the fluid density at flow temperature, and μ is fluid viscosity at flow temperature.

4,511,536
CATALYTIC CONVERTER SECONDARY AIR SUPPLY PIPE SUPPORT

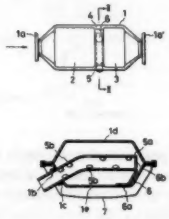
Kozi Shimozi, and Hitoshi Teshima, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 31, 1983, Ser. No. 480,814

Claims priority, application Japan, Jul. 24, 1982, 57-112677[U]

Int. Cl.³ F01N *3/30*

U.S. Cl. 422—171 **5 Claims**



1. In a catalytic converter for exhaust gases from an internal combustion engine, the converter including a casing having an exhaust gas inlet and an exhaust gas outlet disposed at opposite ends of the casing, at least two catalyst units disposed within the casing in series along the path of exhaust gas flow, the two catalyst units being separated by a space extending transversely to the path of exhaust gas flow, and a secondary air supply pipe having a downstream end portion inserted from the outside through means defining a hole provided in the casing into the transverse space, the inserted portion of said pipe having a plurality of openings for introducing secondary air into said space, wherein the improvement comprises:

the inserted portion of the secondary air supply pipe has a base portion that is sealingly secured to the casing in the vicinity of said hole provided in the casing and a downstream end located in said transverse space adjacent to, but spaced from, a portion of the casing opposite said hole, and

an elongated spring means in the form of an elongated flat metal strap having a first end and a second end joined by a constricted central portion supports the downstream end of the portion of the secondary air supply pipe inserted in the casing, such that the first end of the metal strap is secured to and sealingly covers said downstream end of the secondary air supply pipe and the second end of the metal strap is secured to the casing at a location offset laterally from the downstream end of the supply pipe such that the strap will yieldably bend in response to thermal expansion and contraction of the supply pipe with respect to the casing.

4,511,537
EXTRACTION ZONE

Robert J. Fiocco, Summit, and James D. Bushnell, Berkeley Heights, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 16, 1982, Ser. No. 450,350

Int. Cl.³ B01D *11/04*

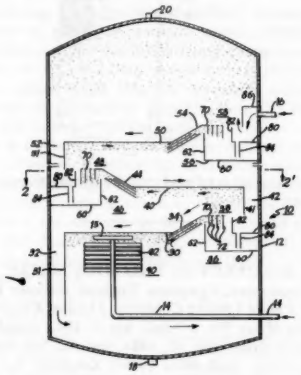
U.S. Cl. 422—256 **23 Claims**

1. An extraction zone for the separation of a feed having a first component and a second component by contacting the feed with a solvent having a density differing from that of the feed to thereby form a relatively light phase and a relatively heavy phase, said extraction zone of the type comprising:

A. a tower having vertically spaced-apart feed and solvent inlets and vertically spaced-apart light phase and heavy phase outlets;

B. a plurality of vertically spaced-apart trays disposed in said tower;

C. riser means associated with at least one of said trays adapted to provide a flow path for the light phase from



below said tray to above said tray, said riser means comprising a plurality of fluid conduits having restricted outlet orifices to convey the light phase without substantial dispersion of the light phase into droplets; and

D. downcomer means associated with at least one of said trays adapted to provide a flow path for the relatively heavy phase from above said tray to below said tray, whereby the light phase passes upwardly through the heavy phase, the light phase and the heavy phase exiting the tower through said respective outlets.

4,511,538
APPARATUS FOR STERILIZING PACKAGING CONTAINERS

Norbert Buchner, Winnenden, and Günther Vögele, Schönaich, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,330

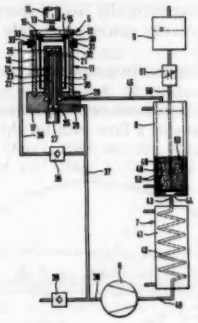
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1981, 3150035

Int. Cl.³ A61L *2/20;* **G05D** *7/00*

U.S. Cl. 422—303 **4 Claims**

1. An apparatus for sterilizing packaging containers which comprises: a closable chamber, a closure means for closing said closable chamber, said closure means including means for suspending a container to be sterilized within said chamber, means for the preparation of a sterilizing mixture of hot air and sterilizing agent vapor, means for directing said mixture into said closable chamber containing at least one container, wherein said mixture is directed into said container along a linear axis, passes along the inner wall of said container and then along the outside of said container, a reversing valve means within said chamber for admitting a circulation of said

sterilizing mixture into said container during sterilization thereof and for directing said sterilization mixture back to said



means for preparation of said mixture during the open state of the chamber.

4,511,539

RECOVERY OF PRECIOUS METAL

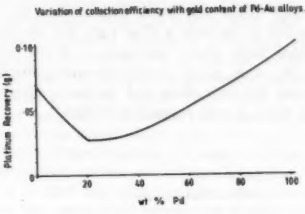
David J. Stephenson, Kempston, England, assignor to Johnson Matthey Public Limited Company, London, England

Continuation of Ser. No. 367,063, Apr. 9, 1982, abandoned. This application Mar. 19, 1984, Ser. No. 590,546

Claims priority, application United Kingdom, Apr. 10, 1981, 8111374

Int. Cl.[3] **B01J** *19/04;* **C01B** *21/28;* **C22B** *11/02*

U.S. Cl. 422—311 **21 Claims**



1. A getter for recovery of precious metal lost from a precious metal-containing catalyst operating at elevated temperature which comprises a self-supporting or supported agglomeration or assemblage of unwoven, randomly oriented fibres of a length falling within the range of ¼ to 4 inches, an irregular surface and made from a precious metal selected from the group consisting of ruthenium, rhodium, palladium, iridium, platinum, gold, silver and alloys containing one or more of the said metals, said fibres being produced by a melt extraction or melt spun process.

4,511,540

EXPLOITATION OF COPPER, NICKEL AND COBALT BY TREATING MANGANIFEROUS MATRIX OXIDIZED ORES

Charles Crussard, Neuilly; Pierre Maurel, Aix-en-Provence, and Jean Bonhomme, Domont, all of France, assignors to Pechiney Ugine Kuhlmann, Paris, France

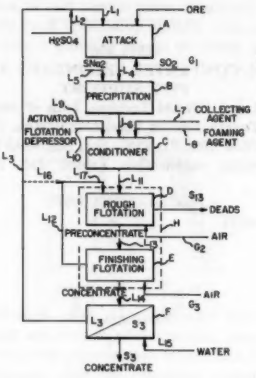
Filed Oct. 26, 1981, Ser. No. 315,349

Claims priority, application France, Oct. 29, 1980, 80 23422

Int. Cl.[3] **C01G** *3/12, 51/00, 53/11*

U.S. Cl. 423—26 **10 Claims**

1. In a process for treating oxidized ores with a manganiferous matrix containing small quantities of copper, nickel and cobalt for the purpose of separating these metals from the ore, wherein said ores are crushed, and then attacked by treatment with a sulfuric acid solution and sulfur dioxide, the improvement comprising the step of injecting said sulfur dioxide into said solution simultaneously with said attack, whereby the post-attack pH of the medium is less than 1.5, and thereafter



precipitating the copper, nickel and cobalt sulfides in the suspension resulting from the attack by introducing an alkaline sulfide, the pH of the precipitation medium being in the range of 0.5–4; and finally separating the aforementioned sulfides by flotation.

4,511,541

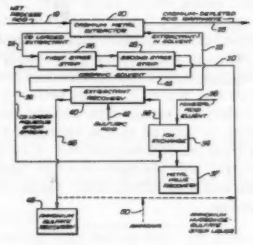
PROCESS FOR THE RECOVERY OF CADMIUM AND OTHER METALS FROM SOLUTION

Laurence W. Bierman; Samuel M. Polinsky; David A. Hempel, and Roger B. Humberger, all of Pocatello, Id., assignors to J. R. Simplot Company, Boise, Id.

Filed Dec. 2, 1982, Ser. No. 446,362

Int. Cl.[3] **C01G** *11/00*

U.S. Cl. 423—100 **22 Claims**



1. A process for selectively recovering the metal values of a metal from a carrier solution, comprising the steps of:

providing a carrier solution having metal values dissolved therein;

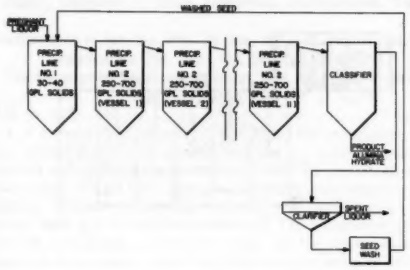
contacting the carrier solution with a thio-organophosphene extractant to extract the metal values as a solid precipitate; and

separating the precipitated metal values from the carrier solution.

4,511,542
BAYER PROCESS PRODUCTION OF ALUMINA HYDRATE

Joseph L. Anjier; Morris L. Roberson, both of Baton Rouge, and William E. Atchison, Greenwell Springs, all of La., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed May 24, 1984, Ser. No. 613,701
Int. Cl.[3] C01F 7/14
U.S. Cl. 423—127 9 Claims


WASHED SEED
PRECIPITATION LIQUOR
PRECIP. LINE NO. 1 30-40 GPL SOLIDS
PRECIP. LINE NO. 2 250-700 GPL SOLIDS (VESSEL 1)
PRECIP. LINE NO. 2 250-700 GPL SOLIDS (VESSEL 2)
PRECIP. LINE NO. 2 250-700 GPL SOLIDS (VESSEL 11)
CLASSIFIER
PRODUCT ALUMINA HYDRATE
CLARIFIER
SPENT LIQUOR
SEED WASH

1. In the process of producing alumina hydrate from supersaturated Bayer process sodium aluminate liquors, the liquors being derived from the digestion of bauxite at elevated temperatures and pressures with a caustic medium, by seeding the liquors with an alumina hydrate seed charge to initiate precipitation of alumina hydrate from the supersaturated liquors, the improvement which comprises:

(a) introducing a supersaturated sodium aluminate liquor into one or more precipitation vessels defined as first precipitation stage, the liquor being characterized by an alumina (Al_2O_3) to caustic weight ratio (A/C) from about 0.575 to about 0.700, wherein the caustic concentration, expressed in grams/liter Na_2CO_3, is in the range from about 165 to about 300 grams/liter;

(b) seeding the liquor with an alumina hydrate seed charge characterized by a particle size distribution wherein up to about 50% by weight of the seed charge consists of particles having a particle size below about 44 microns, the quantity of the seed charge being so selected as to establish a seed charge surface area in relation to the liquor to be seeded within the range from about 1 to about 3 m^2/liter of liquor;

(c) maintaining the seeded liquor at a temperature below about 68° C. (155° F.) for an average time period from about 90 to about 300 minutes to allow precipitation of alumina hydrate and the generation of a slurry having a solids content in the range from about 30 to about 40 g/l;

(d) transferring the slurry into a second precipitation stage, where the slurry solids content is allowed to increase to about 250–700 g/l, without additional seeding, by accumulating solids from the first precipitation stage and maintaining the slurry of increased solids content in the second precipitation stage for a time period sufficient to allow agglomeration and growth of the solids within the temperature range from about 40° to about 55° C. (105°–131° F.);

(e) subjecting the slurry, having the significantly increased solids content, to a separation treatment to recover product alumina hydrate from the slurry, the product being characterized by an average particle size distribution wherein at least about 95% by weight of the particles have a size in excess of 44 microns, and a fine fraction, characterized by a particle size distribution wherein up to about 50% by weight of the particles have a size below about 44 microns and a liquor having an A/C ratio of about 0.375 or less;

(f) recovering the separated product alumina hydrate in a yield of about 80 g/l and above, based on the dissolved alumina (Al_2O_3) content of the supersaturated liquor subjected to precipitation in the first precipitation line and subjecting the fine fraction to a washing step to remove adhered impurities and recycling the washed fraction to the first precipitation stage as seed charge.

5. In the process of producing alumina hydrate from supersaturated Bayer process sodium aluminate liquors, the liquors being derived from the digestion of bauxite at elevated temperatures and pressures with a caustic medium, by seeding the liquors with an alumina hydrate seed charge to initiate precipitation of alumina hydrate from the supersaturated liquors, the improvement which comprises:

(a) introducing a supersaturated sodium aluminate liquor into one or more precipitation vessels defined as first precipitation stage, the liquor being characterized by an alumina (Al_2O_3) to caustic weight ratio (A/C) from about 0.575 to about 0.700, wherein the caustic concentration, expressed in grams/liter Na_2CO_3, is in the range from about 165 to about 300 grams/liter;

(b) seeding the liquor with an alumina hydrate seed charge characterized by a particle size distribution wherein up to about 50% by weight of the seed charge consists of particles having a particle size below about 44 microns, the quantity of the seed charge being so selected as to establish a seed charge surface area in relation to the liquor to be seeded within the range from about 1 to about 3 m^2/liter of liquor;

(c) maintaining the seeded liquor at a temperature below about 68° C. (155° F.) for an average time period from about 90 minutes to about 300 minutes to allow precipitation of alumina hydrate and the generation of a slurry having a solids content in the range from about 30 to about 40 g/l;

(d) transferring the slurry into a second precipitation stage, where the solids content of the slurry is allowed to accumulate to about 250–700 g/l and introducing additional seed into the slurry, the additional seed charge being so selected as to establish a seed surface area in relation to the slurry to be seeded within the range from about 5 to about 10 m^2/liter of slurry;

(e) maintaining the slurry for a time sufficient to allow agglomeration, growth, and cementation of the solids within the temperature range from about 40° to about 68° C.;

(f) subjecting the slurry to a size classification stage to separate product alumina hydrate, characterized by a particle size distribution wherein at least about 95% by weight of the particles have a size in excess of 44 microns, and a fine fraction which is subjected to a further classification stage to recover a relatively coarse alumina hydrate fraction which is employed as seed charge in the second precipitation stage and a fine fraction dispersed in the slurry;

(g) introducing the slurry containing the fine fraction into a clarifier-settler to provide a fine seed product which after washing is used as seed in the first precipitation stage and a spent liquor which is recycled to the Bayer process.

4,511,543
METHOD FOR BENEFICIATION OF PHOSPHATE ROCK

Yehuda Keren, Kiryat Motzkin; Shmuel Carmon, Arad; Meyer Behar, Beer-Sheva, and Shimshon Axelrod, Haifa, all of Israel, assignors to Negev Phosphates Ltd., Dimona, Israel

Filed Mar. 16, 1984, Ser. No. 590,278
Claims priority, application Israel, Mar. 14, 1983, 68400
Int. Cl.[3] C01F 1/00, 5/00
U.S. Cl. 423—167 8 Claims

1. A method for the beneficiation of a calcareous phosphate rock feed which is not magmatic by upgrading its P_2O_5 content and decreasing its cadmium content which method comprises the steps of:

(a) contacting, in a cyclone-type reactor, the phosphate rock feed with hot gases having a temperature between 700° C. and 1600° C. for a time period which is sufficient to separate fine particles comprised of calcite, lime and cadmium

from the heated phosphate rock, the time period being less than 60 seconds; and

(b) removing the fine particles of step (a) by a classification method which separates solids on the basis of size to separate out an upgraded phosphate rock product having a higher P_2O_5 content and a lower cadmium content than in the phosphate rock feed.

4,511,544

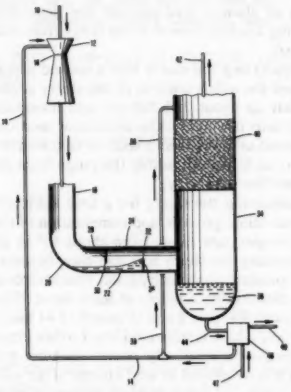
HYDROGEN SULFIDE REMOVAL PROCESS

David E. Connell, El Sobrante, and Colin M. Chapman, Rodeo, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 30, 1983, Ser. No. 537,859

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—224 **8 Claims**



1. An improved process for removing hydrogen sulfide from a gas stream comprising the steps of:

passing a gas stream containing gaseous hydrogen sulfide through a conduit;

introducing a liquid into the gas stream passing through the conduit which reacts with the hydrogen sulfide to produce elemental sulfur;

turning the flow of gas, liquid and elemental sulfur abruptly so that liquid and sulfur particles are partially separated from the gas;

collecting a pool of liquid and sulfur particles with an overflow baffle;

accelerating the gas between the edge of an underflow baffle and the free surface of the pool of liquid upstream of the overflow baffle to obtain gas/liquid contact and using gas momentum to create spray from the overflow baffle through which the gas stream also flows for additional gas/liquid contact;

separating the gas from the liquid and elemental sulfur; and

passing the gas through an absorber column in counterflow relationship with a second flow of the liquid for reaction with residual hydrogen sulfide.

4,511,545

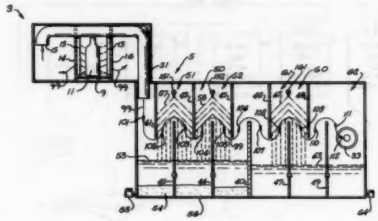
PROCESS FOR TREATING OVERSPRAY GAS FROM GLASS COATING OPERATION WITH METAL RECOVERY

Carroll E. Stone, San Marino, and William F. C. Seifert, Lakewood, both of Calif., assignors to American Engineering Group International, Inc., Vernon, Calif.

Filed May 10, 1983, Ser. No. 493,362

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—240 **10 Claims**



1. A process for treating an overspray gas generated during a hot-end glass coating operation utilizing a metal halide, said process comprising the steps of:

collecting the overspray gas;

passing the overspray gas to a hot spray compartment;

spraying the overspray gas with a hot water spray to decompose the metal halide to a metal precipitate and a hydrogen halide gas;

collecting the metal precipitate and the hot water spray in a warm water collector;

passing the hydrogen halide gas and the overspray gas to a cold spray compartment;

spraying the hydrogen halide gas and the overspray gas with a cold water spray to form an acid;

diluting the acid to form a cold water effluent; and

discharging the overspray gas from the cold spray compartment.

4,511,546

LINEAR, SUBSTANTIALLY WATER-INSOLUBLE AMMONIUM POLYPHOSPHATES AND PROCESS FOR MAKING THEM

Klaus Schrödter, Cologne, and Alexander Maurer, Hürth, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 8, 1983, Ser. No. 464,982

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208202

Int. Cl.³ C01B *25/30*

U.S. Cl. 423—305 **2 Claims**

1. A process for making linear, substantially water-insoluble ammonium polyphosphates of the general formula $(NH_4PO_3)_{10\text{-}1000}$ by heating and continuously mixing phosphorus pentoxide and ammonium orthophosphate in a molar ratio of 1:0.9 to 1:1.1 in the presence of ammonia and tempering the resulting reaction product over a period of several hours at 200° to 400° C. in the presence of ammonia which comprises subjecting the phosphorus pentoxide and ammonium orthophosphate at 50° to 150° C. to the following successive operations which provide

(a) for them to be reacted with ammonia over a period of 5 to 15 minutes under an overpressure of 1–2 millibars,

(b) for them to be mixed under nitrogen for 10 to 60 minutes at atmospheric pressure while arresting the supply of ammonia,

(c) for them to be reacted with ammonia over a period of 1 to 3 hours under a pressure 1 to 5 millibars lower than atmospheric pressure, and tempering the reaction prod-

uct, the ammonia being used in an overall stoichiometric excess of at most 20 mol%.

4,511,547
PROCESS FOR PREPARING CRYSTALLINE ALUMINOSILICATE ZEOLITES USING A CARBOXYLIC ACID

Kazuyoshi Iwayama, Kamakura; Takao Kamano, Yokohama; Kuniyuki Tada, Kamakura, and Takehisa Inoue, Tokyo, all of Japan, assignors to Toray Industries, Incorporated, Tokyo, Japan

Continuation of Ser. No. 342,773, Jan. 26, 1982, abandoned. This application Dec. 22, 1983, Ser. No. 564,357
Claims priority, application Japan, Jan. 27, 1981, 56-9633
Int. Cl.[3] C01B *33/28*
U.S. Cl. 423—329 **7 Claims**

1. A process for preparing a crystalline aluminosilicate zeolite, which process comprises reacting an aqueous reaction mixture containing a silica source, an alumina source, an alkali source and a single type of organic template, said single type of organic template consisting essentially of an organic compound having 3 to 6 carbon atoms and 1 to 3 carboxyl groups and not containing an aromatic ring, and the composition, in terms of mole ratios, of said reaction mixture being as follows:

SiO_2/Al_2O_3	above 20
H_2O/SiO_2	5 to 100
OH^-/SiO_2	0.05 to 0.40
A/Al_2O_3	0.10 to 200

wherein A represents said organic compound, said process being conducted at a crystallization temperature of 140°–180° C. to form a crystalline aluminosilicate zeolite having the following X-ray diffraction pattern:

d(Å)	100 I/Io
11.2 ± 0.2	S
10.1 ± 0.2	S
9.8 ± 0.2	M
6.37 ± 0.1	W
6.00 ± 0.1	W
5.71 ± 0.1	W
5.58 ± 0.1	W
4.37 ± 0.08	W
4.27 ± 0.08	W
3.86 ± 0.08	VS
3.82 ± 0.02	VS
3.75 ± 0.08	S
3.72 ± 0.08	S
3.66 ± 0.05	M
3.00 ± 0.05	M
2.00 ± 0.05	W

wherein VS=very strong, S=strong, M=medium strength and W=weak.

2. A process for preparing a crystalline aluminosilicate zeolite, which process comprises reacting an aqueous reaction mixture containing a silica source, an alumina source, an alkali source and a single type of organic template, said single type of organic template consisting essentially of an organic compound having 3 to 6 carbon atoms and 1 to 3 carboxyl groups and not containing an aromatic ring, and the composition, in terms of mole ratios, of said reaction mixture being as follows:

SiO_2/Al_2O_3	15 to 75
H_2O/SiO_2	10 to 50
OH^-/SiO_2	0.14 to 0.40
A/Al_2O_3	0.10 to 50

wherein A represents said organic compound, said process being conducted at a crystallization temperature of 140°–180° C. to form a crystalline aluminosilicate zeolite having the following X-ray diffraction pattern:

d(Å)	100 I/Io
13.6 ± 0.2	M
10.2 ± 0.2	W
9.0 ± 0.2	S
6.56 ± 0.1	S
6.40 ± 0.1	M
6.05 ± 0.1	W
5.80 ± 0.1	M
4.52 ± 0.08	M
3.99 ± 0.08	S
3.83 ± 0.08	W
3.76 ± 0.08	W
3.53 ± 0.05	W
3.46 ± 0.05	VS
3.38 ± 0.05	S
3.28 ± 0.05	W
3.20 ± 0.05	S
3.15 ± 0.05	W
2.89 ± 0.05	M
2.51 ± 0.05	W

wherein VS=very strong, S=strong, M=medium strength and W=weak.

4,511,548
AMMOXIDATION OF METHANOL TO PRODUCE HYDROGEN CYANIDE

T. G. Attig, Aurora, and R. K. Grasselli, Chagrin Falls, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 332,034, Dec. 18, 1981, abandoned. This application Aug. 10, 1983, Ser. No. 521,817
Int. Cl.[3] C01C *3/02*
U.S. Cl. 423—376 **9 Claims**

1. A process for ammoxidizing a reactant selected from the group consisting of methanol, formaldehyde and dimethyl ether to produce HCN, said process comprising contacting said reactant, ammonia and oxygen at a temperature of 200° to 600° C. in the vapor phase with an oxide complex catalyst of the formula

$$R_pX_qT_rZ_sFe_tSb_uP_vO_x$$

wherein

R is one or more elements selected from Groups IA and IB of the Periodic Table and tl;

X is Bi, Te or mixtures thereof;

T is Cr, Co, Cu, Ce, Th, B, Sn or mixtures thereof; and

Z is W, Mo, V or mixtures thereof, and further

wherein

p=0 to 3,

q=0 to 1,

r=0 to 4,

s=0 to 3,

t=0 to 5,

u=5 to 10,

v=4 to 10, and

x is a number sufficient to satisfy the valence requirements of the other elements present,

and wherein u/v is ½ to 3/2.

4,511,549

PROCESS FOR THE ELIMINATION OF WASTE WATER PRODUCED UPON THE DESULFURIZATION OF COKING OVEN GAS BY MEANS OF WASH SOLUTION CONTAINING ORGANIC OXYGEN-CARRIER, WITH SIMULTANEOUS RECOVERY OF ELEMENTAL SULFUR

Peter Diemer; Werner Brake, and Rainer Dittmer, all of Essen, Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,691

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3127221

Int. Cl.³ C01B *17/05*

U.S. Cl. 423—574 R 9 Claims

1. In a process for the elimination of H_2S-containing waste water produced upon the desulfurization of coking oven gas by means of a washing solution containing organic oxygen carrier with simultaneous recovery of elemental sulfur, of the type in which the waste water is decomposed in a combustion chamber in a reducing atmosphere at temperatures between about 1000° and 1100° C. and in the H_2S— and SO_2—containing exhaust gas in the combustion chamber the mole ratio of H_2S:SO_2 amounts to at least 2:1, the sulfur produced therewith is separated, the sensible heat of the exhaust gas is utilized for steam generation and finally the cooled and desulfurized exhaust gas is added to the coking oven gas before a pre-cooling thereof, the improvement comprising separating out sulfur from the washing solution in an oxidizer of a desulfurization plant and leading the separated sulfur into the combustion chamber together with the part of the washing solution which is discharged as waste water from the washing solution circulation, sulfur loading of the waste water amounting to up to about 370 kg sulfur per m^3 waste water.

4,511,550

1-(P-SUBSTITUTED OR UNSUBSTITUTED AMINOALKYL)PHENYLPROPANE-1,2-DIONE BIS(THIOSEMICARBAZONE) DERIVATIVES, AND THEIR PRODUCTION AND USE

Akira Yokoyama, Otsu; Yasushi Arano, Uji, and Takeo Hosotani, Kyoto, all of Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo, Japan

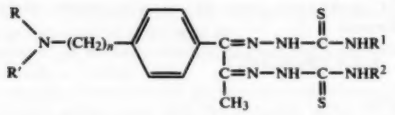
Filed Nov. 3, 1982, Ser. No. 438,776

Claims priority, application Japan, Sep. 7, 1982, 57-155627; Sep. 7, 1982, 57-155628; Sep. 8, 1982, 57-157372

Int. Cl.³ A61K *43/00, 49/00*

U.S. Cl. 424—1.1 35 Claims

1. A compound of the formula:



wherein R, R', R^1 and R^2 are each a hydrogen atom or a C_1-C_3 alkyl group and n is an integer of 1 to 3.

4,511,551

METHOD AND COMPOSITION FOR THE DETECTION OF A PRECANCEROUS OR LEUKEMIC CONDITION IN MAMMALS

Nathan Cardarelli, and Bernadette Cardarelli, both of Akron, Ohio, assignors to Unique Technologies, Incorporated, Mogadore, Ohio

Filed Nov. 18, 1982, Ser. No. 442,819

Int. Cl.³ A61K *43/00, 49/00*

U.S. Cl. 424—1.1 11 Claims

1. A diagnositic method for determining the presence of or predisposition to cancer in a mammel comprising:

providing a radioactive isotope of tin;

administering said isotope to a mammalian individual; and

thereafter measuring the accumulation of said isotope in the body of said individual by gamma emission;

wherein the lack of accumulation of said isotope in the lymphatic system and the thymus indicates the presence of or predisposition to cancer in said individual.

4,511,552

DEODORANT-DISPENSING PRODUCTS AND DISPENSING PROCESS

James P. Cox, 246 E. Bartlett Rd., Lynden, Wash. 98264

Filed Sep. 23, 1974, Ser. No. 508,172

Int. Cl.³ A61L *9/01*

U.S. Cl. 424—14 35 Claims

1. A solid deodorant-dispensing product in the form of a floatable solid body of substantial size which is durable and stably form-maintaining when in contact with water, comprising deodorant, release retardant for said deodorant, binder, and floatable material, said binder and floatable material being substantially insoluble in water and substantially nonreactive chemically with water.

4,511,553

COATING PROCESS AND AGENT FOR CARRYING OUT THE PROCESS

Werner Boesig, Garmisch-Partenkirchen, and Bernd Pritzwald-Stegmann, Edling, both of Fed. Rep. of Germany, assignors to Meggle Milchindustrie GmbH & Co. KG, Reitmehring, Fed. Rep. of Germany

Continuation of Ser. No. 181,570, Aug. 27, 1980, abandoned. This application Apr. 27, 1984, Ser. No. 604,406

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1979, 2936040

Int. Cl.³ A61K *9/36*

U.S. Cl. 424—35 5 Claims

1. In a process for coating cores of pharmaceutical dragées, chocolate centers, and hazelnuts, with a saccharose coating agent; the improvement comprising mixing the saccharose with lactose in a proportion by weight of 90:10 to 50:50, and with water to form the coating agent, and thereafter coating the centers with the coating agent.

4,511,554

NON-STAINING ANTIPERSPIRANT STICK COMPOSITION

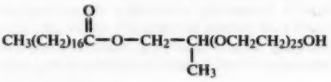
Navin Geria, Warren, and Chung T. Shin, Livingston, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Continuation of Ser. No. 387,390, Jun. 11, 1982, abandoned, which is a continuation-in-part of Ser. No. 155,688, Jun. 2, 1980, abandoned. This application May 4, 1984, Ser. No. 606,864

Int. Cl.³ A61K *7/32, 7/34, 7/36, 7/38*

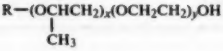
U.S. Cl. 424—65 8 Claims

1. An antiperspirant stick composition comprising a matrix and an antiperspirant quantity of active antiperspirant material distributed therein; said stick composition containing a mixture of polyoxyethylene(25)propylene glycol stearate of formula:



(I)

and a polyoxypropylene, polyoxyethylene ether of a long chain fatty alcohol of formula:



(II)

wherein:

R is a long chain fatty alcohol moiety;

x has an average value of from 3 to 10; and

y has an average value of from 2 to 50

said mixture being present in sufficient quantity to reduce the staining potential of said composition; wherein said polyoxyethylene(25)propylene glycol stearate is present in the range of from about 1% to about 15% by weight and said polyoxypropylene, polyoxyethylene ether of said fatty alcohol is present in the range of from about 2% to about 40% by weight; said percentages being based on the total weight of the stick composition.

4,511,555

HERBAL HAIR TREATMENT COMPOSITIONS

Valerie F. Faust, 4009 Glenwood Rd., Brooklyn, N.Y. 11210

Filed Sep. 27, 1982, Ser. No. 424,279

Int. Cl.³ A61K *7/06, 35/78;* **C07G** *17/00*

U.S. Cl. 424—74 **5 Claims**

1. An herbal hair treatment composition for controlling dandruff comprising a cosmetically acceptable carrier and a vegetable oil extract of sage, Indian hemp, and rosemary prepared by heating 24 oz. by wt. each of sage stems and leaves, Indian hemp leaves, and rosemary needles in 176 to 256 fluid oz. of a vegetable oil for about 3 to 5 hours at a temperature of about 100° to 190° F. with agitation, followed by filtering off residual solids from the extract.

4,511,556

INACTIVATION OF A LIPID VIRUS

Robert H. Purcell, Boyds, Md., and Stephen M. Feinstone, Washington, D.C., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jun. 10, 1982, Ser. No. 386,991

Int. Cl.³ A61K *35/14, 39/12, 31/02;* **C12N** *7/06*

U.S. Cl. 514—743 **21 Claims**

13. A method of inactivating viruses that contain essential lipids in a blood plasma product which comprises contacting said product with at least one halohydrocarbon treating agent selected from the group consisting of chloroform and a freon for about one-half to five hours at a temperature of about 4°–40° C. and at about 5–50% v/v and removing said treating agent.

16. The method of claim 13 wherein the virus is a hepatitis virus selected from hepatitis B virus and non-A, non-B hepatitis virus.

4,511,557

PHARMACEUTICAL COMPOSITION

Kailash K. Gauri, Zur Waldburg 13, Lentföhrden, Fed. Rep. of Germany D 2359

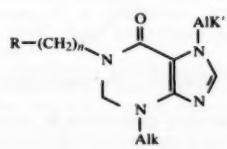
Filed Aug. 20, 1982, Ser. No. 409,993

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1981, 3133445

Int. Cl.³ A61K *35/14*

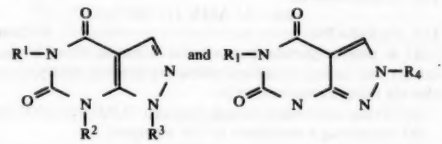
U.S. Cl. 514—263 **8 Claims**

1. A composition for increasing oxygen supply in tissue of warm-blooded animals comprising at least one vasoactive compound selected from the group consisting of (a) calcium 2,5-dihydroxy-phenylsulfonate, (b) 3,7-dihydro-3,7-dialkyl-1H-purine-2,6-dione of the formulae

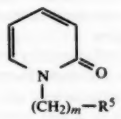


wherein AlK and AlK′ are individually alkyl of 1 to 4 carbon atoms, n is an integer from 2 to 4 and R is selected from the group consisting of

and —CH_2—CH_3, (c) a pyrazolo-[3,4-d]pyrimidines of the formulae



wherein R^1 and R^2 are individually selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms and alkylcarbonylalkyl of 4 to 8 carbon atoms, R^3 is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms and R^4 is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms and alkenyl of 2 to 6 carbon atoms with the proviso that R^1 and R^2 are not both hydrogens, (d) a pyridone of the formula



wherein m is an integer from 2 to 4 and R^5 is selected from the group consisting of

—CH_2—CH_3 and —CH_2—CH_2—OH and (e) a compound selected from the group consisting of nicergoline, vincamine and dipyridamol and a potentiating amount of a lipid-free dialyzed concentrate of deproteinized, enzymatically hydrolyzed calf's blood with the blood constituents having a molecular weight less than 10,000.

4,511,558

ALPHA-LACTALBUMIN CONTRACEPTIVE

Barry D. Shur, Houston, Tex., assignor to University Patents, Inc., Westport, Conn.

Filed May 16, 1983, Ser. No. 495,035

Int. Cl.³ C12Q *1/54, 1/48;* **C12N** *9/96;* **A61K** *37/00, 31/00, 35/48;* **A01N** *1/02*

U.S. Cl. 514—8 **6 Claims**

1. A contraceptive composition suitable for introduction into the reproductive tract of a female mammal comprising a contraceptively effective amount of biologically-active alpha-lactalbumin contained in a biocompatible carrier material which will not de-activate the alpha-lactalbumin and which is suitable for administering the alpha-lactalbumin to the female mammal's reproductive tract in amounts sufficient to induce contraception.

4,511,559

BIOLOGICALLY ACTIVE POLYSACCHARIDE CONCENTRATES AND PROCESS FOR PRODUCTION OF PREPARATES CONTAINING SUCH SUBSTANCES

Kálmán Szendrei; Emil Minker; Zsuzsanna Rózsa, all of Szeged; Lehel Koch, and Lajos Wolf, both of Budapest, all of Hungary, assignors to Központi Váltó-és Hitelbank Rt. InnovációAlap, Budapest, Hungary

Filed Mar. 4, 1983, Ser. No. 472,060

Claims priority, application Hungary, Mar. 4, 1982, 660/82; Feb. 9, 1983, 660/82

Int. Cl.³ A61K *31/715*

U.S. Cl. 514—54 8 Claims

1. A polysaccharide composition obtained from a plant extract and having an anti-inflammatory activity, said polysaccharide being characterized by:

(a) having a molecular weight between 75,000 and 2,000,000;

(b) containing a maximum of 5% nitrogen;

(c) containing a maximum of 5% phosphorus expressed as P_2O_5;

(d) containing a maximum of 25% ash;

(e) containing a minimum of 30% reducing sugar;

(f) containing a minimum of 60% of total sugar after acidic hydrolysis, expressed as glucose;

(g) substantial freedom from substances with a molecular weight below 75,000 on analysis on a column filled with Sephadex G-75 molecular sieve;

(h) yielding members selected from the group consisting of glucose, galactose, xylose, rhamnose, arabinose and uronic acid and containing at least two of said members upon acid hydrolysis;

(i) exhibiting an anti-inflammatory activity of the same order as phenylbutazone or indomethacin as measured by the rat paw carrageenin oedema test; and

(k) their LD_{50} value in mouse per os is greater than 3000 mg/kg and in rat greater than 2000 mg/kg.

8. A method of treating an inflammatory condition which comprises administering to a susceptible subject an anti-inflammatory effective amount of a polysaccharide as defined in claim 1.

4,511,560

ANTIBIOTIC SUBSTANCES DC-45, AND THEIR USE AS MEDICAMENTS

Fusao Tomita; Tatsuya Tamaoki; Kunikatsu Shirahata, all of Machida; Takao Iida, Tokyo; Makoto Morimoto, Numazu, and Kazuhisa Fujimoto, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo, Japan

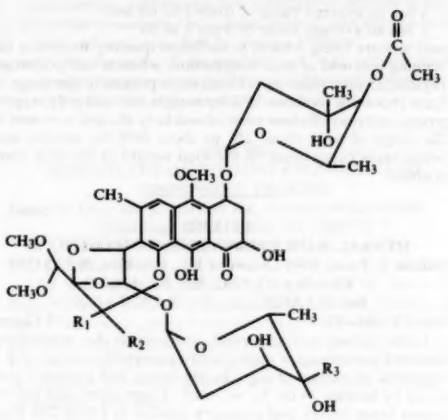
Continuation-in-part of Ser. No. 259,386, May 1, 1981, abandoned, which is a continuation-in-part of Ser. No. 200,299, Oct. 24, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 412,693

Claims priority, application Japan, Oct. 26, 1979, 54-137734

Int. Cl.³ A61K *31/71*; C07H *15/26*; C12P *19/56*

U.S. Cl. 514—27 5 Claims

1. A substance having antibiotic activity and selected from the group consisting of DC-45-A, DC-45B_1 and DC-45-B_2 represented by the following formula:



wherein (i) R_1 and R_2 together with the carbon atom therebetween represent the group

and R_3 represents

(designated DC-45-A); (ii) R_1 represents —OH, R_2 represents —CH_2OH and R_3 represents

(designated DC-45-B_1); or (iii) R_1 and R_2 together with the carbon atom therebetween represent the group

and R_3 represents

(designated DC-45-B_2) or a pharmaceutically acceptable salt thereof.

3. A pharmaceutical composition for use as an antibiotic comprising as active ingredients an effective amount of at least one substances as claimed in claim 1, in association with a pharmacologically acceptable carrier or excipient.

4,511,561
LAXATIVE COMPOSITION COMPRISING PSYLLIUM SEEDS AND SENNA FRUITS

Rolf Madaus, Köln-Brück, and Klaus Görler, Bensberg-Refrath, both of Fed. Rep. of Germany, assignors to Dr. Madaus & Co., Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 223,965, Jan. 12, 1981, abandoned, which is a continuation of Ser. No. 112,490, Jan. 16, 1980, abandoned. This application Jun. 22, 1983, Ser. No. 506,229
Claims priority, application Fed. Rep. of Germany,
Int. Cl.³ A61K *35/78*
U.S. Cl. 424—195.1 **24 Claims**

1. In a method of preparing a laxative based on psyllium seeds and senna fruits, the improvement comprising:

a. separately grinding the psyllium seeds and senna fruits;

b. mixing the separately ground psyllium seeds and senna fruits in a dry state into a dry mixture;

c. further mixing and rapidly and uniformly moistening the dry mixture with sufficient water to prevent substantial swelling of the ground psyllium seeds therein while allowing sufficient swelling thereof to form a mucilage which, from the further mixing, envelops the ground senna fruits, whereby to reduce the undesirable alteration of the senna fruit component and to retard release thereof; and

d. quickly granulating and drying the further mixed and moistened product to a product having residual moisture content of about 3.5% by weight of water in a manner preventing further substantial swelling of the psyllium therein,

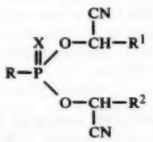
whereby a laxative is obtained having longer lasting moderated action and substantially lessened undesirable side effects including convulsant and pain producing actions, upon use of the said laxative.

4,511,562
(THIO)(DITHIO-PHOSPHATES(PHOSPHONATES), PROCESSES FOR THEIR PREPARATION, AND THEIR USE IN PEST-COMBATING AGENTS

Bernd-Wieland Krüger, Wuppertal, and Wolfgang Behrenz, Overath, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 2, 1982, Ser. No. 404,249
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1981, 3131980; Jun. 7, 1982, 3221479
Int. Cl.³ A01N *57/00, 57/16, 57/26, 65/00*
U.S. Cl. 514—112 **11 Claims**

1. An arthropodicidal composition comprising an arthopodicidally effective amount of (1) a dicyanohydrin (thiono)(dithio)-phosphate or phosphonate of the formula



in which

X represents oxygen or sulphur,

R represents an optionally halogen-substituted radical selected from the group consisting of C_1 to C_5 alkyl, C_2 to C_5 alkenyl, C_2 to C_5 alkinyl, phenyl, benzyl, C_1 to C_5 alkoxy, phenoxy, benzyloxy, C_1 to C_5 alkylthio, phenylthio, benzylthio, mono- or di-(C_1 to C_5 alkyl)-amino, phenylamino and benzylamino, and

R^1 and R^2 are identical or different and individually represent a hydrogen atom, an alkyl radical which has 1 to 20 carbon atoms which is optionally substituted by halogen, cyano, C_1 to C_4 alkoxy or C_1 to C_4 alkylthio, an optionally halogen-substituted C_2 to C_5 alkenyl or C_2 to C_5 alkinyl radical, a C_3 to C_8 cycloalkyl radical which is optionally substituted by C_1 to C_4 alkyl, C_1 to C_4 alkoxycarbonyl, phenoxybenzyloxycarbonyl or halogen, a phenyl-C_1 to C_4 alkyl radical which is optionally substituted by halogen, C_1 to C_4 alkyl or C_1 to C_4 alkoxy, a phenyl radical which is optionally substituted by halogen, cyano, nitro, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, C_1 to C_4 alkylthio, trifluoromethyl or by optionally halogen-substituted C_1 or C_2 alkylenedioxy, a furyl, a thienyl or a pyridyl radical, and (2) an arthropodicidally effective amount of an insecticide selected from the group consisting of a

(A) carbamate,

(B) carboxylate,

(C) phosphate or phosphonate other than (1), and

(D) halogeno-(cyclo)-alkene, the weight ratio of (1):(2) being from about 1:100 to 100:1.

4,511,563
CLEAR ANALGESIC GELS WITH REDUCED TACKINESS

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jul. 15, 1983, Ser. No. 514,293
Int. Cl.³ A61K *9/10, 31/60, 47/00*
U.S. Cl. 514—162 **8 Claims**

1. An analgesic gel which comprises

(a) from 5 to 15 parts of an analgesic compound;

(b) from 10 to 40 parts of a nonionic surfactant which forms a gel in water alone at about 15 to 30 percent by weight based upon the weight of the water plus the weight of the nonionic surfactant;

(c) from 5 to 40 parts of glycerin;

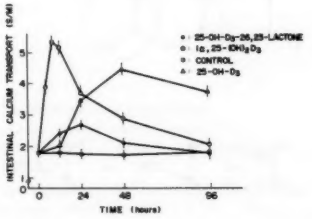
(d) from 40 to 75 parts of water; and

(e) optional ingredients (q.v.), said parts based upon 100 parts of the composition and provided that the weight ratio of nonionic surfactant to water is from 1:2 to 1:5.

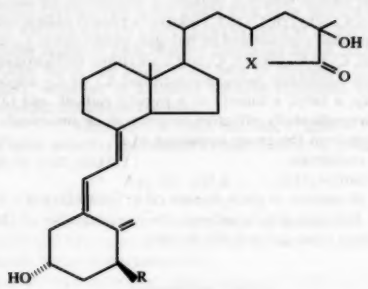
4,511,564
METHODS OF CONTROLLING THE CONCENTRATION OF CALCIUM IN THE SERUM OF WARM-BLOODED ANIMALS AND PHARMACEUTICAL COMPOSITIONS TO BE USED THEREFOR

Seiichi Ishizuka, Hino, and Junji Kubo, Kanagawa, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 29, 1982, Ser. No. 454,309
Claims priority, application Japan, Dec. 29, 1981, 56-213108; Dec. 29, 1981, 56-213109; Oct. 7, 1982, 57-175265
Int. Cl.³ A61K *31/59*
U.S. Cl. 514—167 **7 Claims**



1. A method to decrease the concentration of calcium in the serum of warm-blooded animals characterized by the administration of a pharmaceutically effective amount of 25-hydroxyvitamin D_3-26,23-lactones expressed by the following formula (I) to warm-blooded animals



(I)

wherein R indicates a hydrogen atom or a hydroxyl group and X indicates —O— or —O—O—.

4,511,565

7α-ACYLTHIO-1α,2α-METHYLENE-3-OXO-17α-PREGN-4-ENE-21,17-CARBOLACTONES, THEIR PRODUCTION AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Henry Laurent; Klaus Nickisch; Dieter Bittler; Rudolf Wiechert, and Wolfgang Losert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

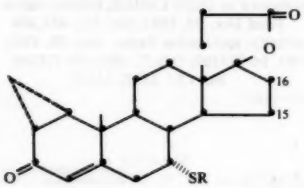
Filed Oct. 28, 1983, Ser. No. 546,352

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1982, 3240510

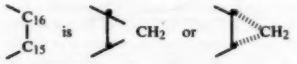
Int. Cl.³ C07J *1/00;* A61K *31/58*

U.S. Cl. 514—173 **13 Claims**

1. A 7α-acylthio-1α,2α-methylene-3-oxo-17α-pregn-4-ene-21,17-carbolactone of the formula



wherein



and

R is C_{2-4}-alkanoyl.

11. A method of achieving an antialdosterone effect in a patient in need of such treatment comprising administering to the patient an amount of a compound of claim 1 effective as an antialdosterone agent.

4,511,566

2-N-CYCLOALKYLMETHYL 3-OXO 5,6-DIARYL-as-TRIAZINES

Guy Pitet, Toulouse; Henri Cousse, and Gilbert Mouzin, both of Castres, all of France, assignors to Pierre Fabre S.A., Castres, France

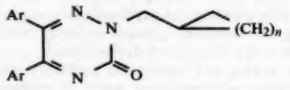
Filed Apr. 16, 1984, Ser. No. 600,473

Claims priority, application France, Apr. 14, 1983, 83 06107

Int. Cl.³ C07D *253/06, 401/04;* A61K *31/53*

U.S. Cl. 514—242 **14 Claims**

1. 2-N-cycloalkylmethyl 3-oxo 5-6-diaryl as-triazine having the formula



in which:

Ar represents phenyl, furyl, thienyl, or pyridyl, which may be substituted by a lower C_1 to C_4 alkoxy radical, and

n is a whole number having a value of 1 to 4.

9. A pharmaceutical composition useful for treating pain which contains an effective pain-relieving amount of at least one compound according to claim 1 together with a pharmaceutically-acceptable carrier.

4,511,567

6-[(4-SUBSTITUTED PIPERAZIN-L-YL)THIOCARBONYLAMINO]BENZAZOLES AND THEIR USE

Jean J. Gallay, Magden, and Ernst Schweizer, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 262,569, May 11, 1981, abandoned. This application Sep. 16, 1982, Ser. No. 418,955

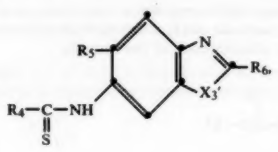
Claims priority, application Switzerland, May 22, 1980, 4016/80

Int. Cl.³ C07D *417/12, 413/12;* A61K *31/495*

U.S. Cl. 514—253 **25 Claims**

1. A compound of the formula

(Ia)



in which

R_4 represents 1-(4-lower alkyl)-piperazino having up to and including 4 C-atoms in the lower alkyl moiety, 1-(4-lower alkyl-4-oxido)-piperazino having up to and including 4 C-atoms in the lower alkyl moiety, or 1-[4-(hydroxy-lower alkyl)]-piperazino in which the hydroxy group is bonded in a position higher than the alpha-position and hydroxy-lower alkyl has up to and including 4 C-atoms and in which

R_5 represents hydrogen, lower alkyl having up to and including 4 C-atoms, lower alkoxy having up to and including 4 C-atoms, or halogen having an atomic number of up to and including 35,

X_3' represents oxy, thio, and

R_6 represents alpha-branched lower alkyl having up to and including 4 C-atoms or straight-chain lower alkyl having up to and including 4 C-atoms bonded by a secondary C-atom, or a salt thereof.

4,511,568
CNS-DEPRESSANT PYRAZOLOPYRIDINES

Thomas M. Bare, West Chester, and Anthony F. Heald, Glen Mills, both of Pa., assignors to ICI Americas Inc., Wilmington, Del.

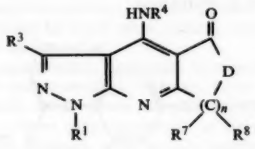
Filed Apr. 15, 1983, Ser. No. 485,191

Claims priority, application United Kingdom, May 12, 1982, 8213700; Jan. 21, 1983, 8301676

Int. Cl.³ A61K *31/44;* **C07D** *471/14, 491/147*

U.S. Cl. 514—293 **19 Claims**

1. A pyrazolopyridine compound of the following formula (I):



(I)

wherein

R^1 is straight or branched chain alkyl of about 1 to 10 carbons; straight or branched chain alkyl of about 1 to 10 carbons independently substituted by 1 or 2 of hydroxy, alkoxy of about 1 to 6 carbons or oxo or such an alkyl group substituted by at least 1 halogen; cycloalkyl of about 3 to 8 carbons; cycloalkylalkyl of about 4 to 12 carbons; alkenyl or alkynyl of about 3 to 10 carbons; aryl of about 6 to 10 carbons; aryl of about 6 to 10 carbons independently substituted by 1 or more of halogen, hydroxy, alkyl of about 1 to 6 carbons, fluorosubstituted alkyl of about 1 to 6 carbons or alkoxy of about 1 to 6 carbons; arylalkyl of about 7 to 12 carbons; or (substituted aryl)alkyl of about 6 to 10 carbons in the aryl and about 1 to 4 carbons in the alkyl wherein the substitution is independently 1 or more of halogen, hydroxy, alkyl of about 1 to 6 carbons, fluoro-substituted alkyl of about 1 to 6 carbons or alkoxy of about 1 to 6 carbons;

R^3 is hydrogen; or straight or branched chain alkyl of about 1 to 6 carbons;

R^4 is hydrogen; straight or branched chain alkyl of about 1 to 10 carbons; hydroxy- or oxo-substituted alkyl of about 1 to 10 carbons; oxo-substituted alkyl of about 1 to 10 carbons substituted by an amino group of the formula $—NR^{17}R^{18}$ wherein R^{17} and R^{18} are independently hydrogen or alkyl of about 1 to 6 carbons; alkenyl or alkynyl of about 3 to 10 carbons; aryl of about 6 to 10 carbons; aryl of about 6 to 10 carbons independently substituted by 1 or more of halogen, hydroxy, alkyl of about 1 to 6 carbons, fluoro-substituted alkyl of about 1 to 6 or alkoxy of about 1 to 6 carbons; arylalkyl of about 7 to 12 carbons; (substituted aryl)alkyl of about 6 to 10 carbons in the aryl and about 1 to 4 carbons in the alkyl wherein the substitution is independently 1 or more of halogen, hydroxy, alkyl of about 1 to 6 carbons, fluoro-substituted alkyl of about 1 to 6 carbons or alkoxy of about 1 to 6 carbons; aryl(oxo-substituted)alkyl of about 7 to 12 carbons; or (substituted aryl)oxo-substituted alkyl of about 6 to 10 carbons in the aryl and about 1 to 4 carbons in the alkyl wherein the substitution is independently one or more of halogen, hydroxy, alkyl of about 1 to 6 carbons, fluoro-substituted alkyl of about 1 to 6 carbons, or alkoxy of about 1 to 6 carbons;

D is oxygen or NR^6;

R^6 is hydrogen; straight or branched chain alkyl of about 1 to 10 carbons; straight or branched chain alkyl of about 1 to 10 carbons independently substituted by 1 or 2 of hydroxy, alkoxy of about 1 to 6 carbons or oxo or such an alkyl substituted by at least 1 halogen; cycloalkyl of about 3 to 8 carbons; cycloalkylalkyl of about 4 to 10 carbons; alkenyl or alkynyl of about 3 to 10 carbons; aryl of about 6 to 10 carbons; aryl of about 6 to 10 carbons independently substituted by 1 or more of halogen, hydroxy, alkyl of about 1 to 6 carbons, alkanoyl of about 1 to 6 carbons, halogenoalkyl of about 1 to 6 carbons, nitro, cyano, alkoxycarbonyl of about 2 to 7 carbons, amino, and mono- and di-alkylsubstituted amino groups of about 1 to 12 carbons; arylalkyl of about 7 to 10 carbons; (substituted aryl)alkyl of about 6 to 10 carbons in the aryl and about 1 to 4 carbons in the alkyl wherein the substitution is independently 1 or more of halogen, hydroxy, alkyl of about 1 to 6 carbons, alkanoyl of about 1 to 6 carbons, alkoxy of about 1 to 6 carbons, halogenoalkyl of about 1 to 6 carbons, nitro, cyano, alkoxycarbonyl of about 2 to 7 carbons, amino and mono- and di-alkylsubstituted amino groups of about 1 to 12 carbons; or aryl(oxo-substituted-)alkyl of about 7 to 12 carbons;

n is 1 or 2;

R^7 and R^8 are independently hydrogen; straight or branched chain alkyl of about 1 to 6 carbons; aryl of about 6 to 10 carbons; aryl of about 6 to 10 carbons independently substituted by 1 or more of halogen, hydroxy, alkyl of about 1 to 6 carbons, fluorosubstituted alkyl of about 1 to 6 carbons or alkoxy of about 1 to 6 carbons; arylalkyl of about 7 to 12 carbons; or (substituted aryl)alkyl of about 6 to 10 carbons in the aryl and about 1 to 4 carbons in the alkyl wherein the substitution is independently 1 or more of halogen, hydroxy, alkyl of about 1 to 6 carbons, fluoro-substituted alkyl of about 1 to 6 carbons or alkoxy of about 1 to 6 carbons;

or a pharmaceutically-acceptable acid-addition salt thereof.

17. A pharmaceutical composition for the treatment of anxiety, relief of tension, suppression of convulsions, relaxation of skeletal muscles, and for inducing sleep comprising a pharmaceutically effective amount of a pyrazolopyridine compound of claim **1** in association with a pharmaceutical carrier.

4,511,569
TRICYCLIC LACTAMS AND DERIVATIVES USEFUL IN INCREASING CARDIAC CONTRACTILITY

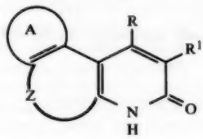
Elizabeth M. Smith, Verona; Ronald J. Doll, Maplewood, and Bernard R. Neustadt, West Orange, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Aug. 26, 1982, Ser. No. 411,764

Int. Cl.³ A61K *31/47, 31/44;* **C07D** *471/04, 215/22*

U.S. Cl. 514—290 **19 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl;

R^1 is hydroxy, lower alkoxy, cyano, halogen, $—NR^2R^3$, $—CONR^2R^3$, $—NHCOR^2$, $—COOR^2$ (wherein R^2 and R^3 are independently hydrogen, lower alkyl, or hydroxy lower alkyl) or

wherein M is sulfur or NH;

Z is selected from the group consisting of

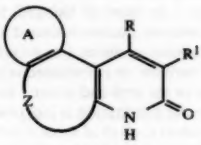
(
$(CH_2)_n$, —CH=CH—
(

wherein n is 1,2,3 or 4;

A is a substituted or unsubstituted benzo or pyrido ring which when substituted have 1 to 3 substituents independently selected from halogen, hydroxy, lower alkyl and lower alkoxy;

or a pharmaceutically acceptable salt thereof.

14. A method for increasing cardiac contractility in a patient requiring such treatment which comprises administering an amount effective in increasing cardiac contractility of a compound of the formula



wherein R is hydrogen or lower alkyl;

R^1 is hydrogen, hydroxy, lower alkoxy, cyano, lower alkyl, halogen.

$—NR^2R^3$, $—CONR^2R^3$,—$NHCOR^2$, $—COOR^2$ (wherein R^2 and R^3 are independently hydrogen, lower alkyl, or hydroxy lower alkyl) or

wherein M is sulfur or NH; with the proviso that R and R^1 are not both hydrogen;

Z is selected from the group consisting of

(
$(CH_2)_n$, —CH=CH—
(

wherein n is 1,2,3 or 4;

A is a substituted or unsubstituted benzo or pyrido ring which when substituted have 1 to 3 substituents independently selected from halogen, hydroxy, lower alkyl and lower alkoxy;

or a pharmaceutically acceptable salt thereof.

4,511,570

SENILE DEMENTIA TREATMENT

Ronald R. Tuttle, Miami, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Filed Mar. 28, 1983, Ser. No. 479,638
Int. Cl.³ A61K *31/485*
U.S. Cl. 514—282 **4 Claims**

1. A method of orally treating a patient suffering from senile dementia which comprises the periodic oral delivery of a pharmaceutically effective amount of 6-methylene-6-desoxy-N-cyclopropylmethyl-14-hydroxydihydronormorphone to said patient to counter the progression of senile dementia in said subject.

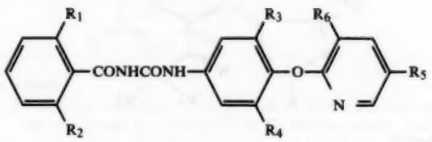
4,511,571

N-(2-PYRIDYLOXYPHENYL)-N'-BENZOYL UREAS, PESTICIDAL COMPOSITIONS CONTAINING SAME AND PESTICIDAL METHODS OF USE

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany; Josef Ehrenfreund, Allschwil, Switzerland; Pierre Martin, Rheinfelden, Switzerland, and Eginhard Steiner, Füllinsdorf, Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Oct. 12, 1982, Ser. No. 433,763
Claims priority, application Switzerland, Oct. 20, 1981, 6691/81; May 26, 1982, 3231/82; Sep. 3, 1982, 5248/82
Int. Cl.³ C07D *213/64;* **A01N** *43/40*
U.S. Cl. 514—351 **16 Claims**

1. A compound of the formula



wherein

each of R_1, R_2, R_3 and R_4 is independently selected from the group consisting of hydrogen, methyl, fluoro, chloro or bromo;

R_5 is a chlorinated ethyl substituent selected from the group consisting of 2-chloro-1,1,2,2-tetrafluoroethyl; 2,2-dichloro-1,1,2-trifluoroethyl; pentachloroethyl; 1,1-difluoro-2,2,2-trichloroethyl; 1,1-dichloroethyl; 2-chloroethyl; 2,2-dichloroethyl; and 2,2,2-trichloroethyl; and

R_6 is fluoro, chloro or bromo.

16. The method of combating insects and members of the order Acarina which comprises applying to them or to their locus an effective amount of a compound according to claim **1**.

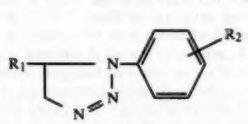
4,511,572

TRIAZOLINE ANTICONVULSANT DRUGS

Pankaja K. Kadaba, Lexington, Ky., assignor to The University of Kentucky Research Foundation, Lexington, Ky.

Filed Mar. 18, 1983, Ser. No. 476,792
Int. Cl.³ A61K *31/44, 31/41, 31/49*
U.S. Cl. 514—340 **13 Claims**

1. An anticonvulsant composition comprising as the active ingredient an anticonvulsive effective amount of a compound selected from the group consisting of those of the formulae:



wherein R_1 is 4-pyridyl, 2-pyridyl, and R_2 is hydrogen, m- or p-trifluoromethyl, p-methyl, p-ethyl, m- or p-chloro, m-nitro, p-bromo, p-fluoro or p-$COOR_3$ wherein R_3 is lower alkyl of 1 to 4 carbon atoms, and a carrier.

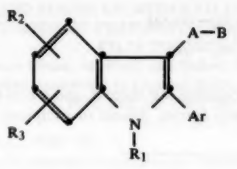
4,511,573

3-SUBSTITUTED-2-(HETEROARYL) INDOLES

Harris B. Renfroe, West Nyack, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 17, 1983, Ser. No. 495,367
Int. Cl.³ A61K *31/44;* **C07D** *401/04, 403/04*
U.S. Cl. 514—332 **20 Claims**

1. A compound of the formula



(I)

wherein

R_1 represents hydrogen or lower alkyl;

Ar represents 3-pyridyl or 1-imidazolyl, each unsubstituted or substituted by lower alkyl, carboxy, lower alkoxycarbonyl or carbamoyl;

R_2 and R_3 independently represent hydrogen, lower alkyl, halogen, trifluoromethyl, hydroxy, lower alkoxyl, carboxy-lower alkyl, lower alkoxycarbonyl-lower alkyl, carboxy, lower alkoxycarbonyl, or lower alkyl-(thio, sulfinyl or sulfonyl), or R_2 and R_3 together on adjacent carbon atoms represent lower alkylenedioxy;

A represents straight chain or branched alkylene of 3 to 12 carbon atoms in which the number of the carbon atoms separating the indole nucleus from group B is 3 to 12, straight chain or branched alkenylene of 2 to 12 carbon atoms, straight chain or branched alkynylene of 2 to 12 carbon atoms, lower alkylenephenyl-lower (alkylene or alkenylene,) lower alkylene-phenylene, lower alkylene-(thio or oxy)-lower alkylene, lower alkylene-(thio or oxy)-phenylene, or lower alkylene-phenylene(thio or oxy)-lower alkylene;

B represents carboxy, carboxy esterified in form of a pharmaceutically acceptable ester, carbamoyl, mono- or di-lower alkylcarbamoyl, hydroxymethyl, cyano, hydroxycarbamoyl, 5-tetrazolyl or formyl; the imidazolyl and pyridyl N-oxide thereof, or a pharmaceutically acceptable salt thereof.

4,511,574

N-(4-PHENYL-2-THIAZOLYL)CARBAMATE DERIVATIVES

Isao Sakano; Tatsuro Yokoyama; Seitaro Kajiya, all of Yokohama; Yutaka Okazaki; Hiroshi Tokuda, both of Mobara; Hiroshi Kawazura; Mikio Kumakura, both of Mobara; Takuo Nakano, and Akira Awaya, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Kagaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00003, § 371 Date Sep. 8, 1982, § 102(e) Date Sep. 8, 1982, PCT Pub. No. WO82/02384, PCT Pub. Date Jul. 22, 1982

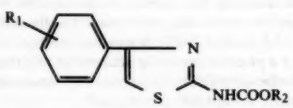
PCT Filed Jan. 8, 1982, Ser. No. 417,115

Claims priority, application Japan, Jan. 8, 1981, 56-714; May 18, 1981, 56-73520

Int. Cl.³ C07D *277/48;* A01K *31/425*

U.S. Cl. 514—371 **9 Claims**

1. An N-(4-phenyl-2-thiazolyl)carbamate compound represented by the formula:



wherein R_1 denotes a lower alkylsulfinyl, lower alkylsulfonyl, nitro or amino group, and R_2 represents a lower alkyl or halogeno-lower alkyl group.

4,511,575

ANTIDIABETIC PYRROLECARBOXYLIC ACIDS

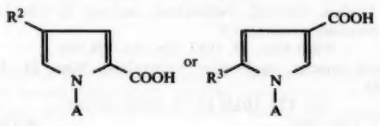
Gerald F. Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 256,933, Apr. 23, 1981, Pat. No. 4,351,843, which is a division of Ser. No. 128,199, Mar. 7, 1980, Pat. No. 4,282,242. This application Aug. 9, 1982, Ser. No. 406,306

Int. Cl.³ A61K *31/40*

U.S. Cl. 514—423 **11 Claims**

1. A method of lowering the level of blood glucose in a hyperglycemic mammal which comprises administering to said hyperglycemic mammal a compound selected from the group consisting of pyrrole carboxylic acids having the formula



(VII) (VIII)

wherein

A is selected from the group consisting of hydrogen and (C_1-C_2)alkyl;

R^2 is selected from the group consisting of benzyl, phenyl, chloro, 4-chlorophenyl and 4-chlorophenoxy; and

R^3 is selected from the group consisting of benzyl and chloro;

or a pharmaceutically-acceptable salt thereof in an amount sufficient to lower said blood glucose level in said hyperglycemic mammal.

4,511,576

ANTIDIABETIC PYRROLECARBOXYLIC ACIDS

Gerald F. Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 256,933, Apr. 23, 1981, Pat. No. 4,351,843, which is a division of Ser. No. 128,199, Mar. 7, 1980, Pat. No. 4,282,242. This application Aug. 10, 1982, Ser. No. 406,921

Int. Cl.³ A61K *31/40*

U.S. Cl. 514—423 **5 Claims**

1. A method of lowering the level of blood glucose in a hyperglycemic mammal which comprises administering to said hyperglycemic mammal a compound selected from the group of pyrrole carboxylic acids consisting of:

4,5-bis(4-methoxyphenylthio)pyrrole-3-carboxylic acid;

1-methyl-4,5-bis(phenylthio)pyrrole-2-carboxylic acid;

4-methyl-5-benzoylpyrrole-3-carboxylic acid;

4-phenyl-5-benzoylpyrrole-3-carboxylic acid;

4-bromo-5-benzoylpyrrole-2-carboxylic acid;

5-bromo-4-benzoylpyrrole-2-carboxylic acid; and

1-methyl-4,5-dibromopyrrole-2-carboxylic acid;

or a pharmaceutically-acceptable salt thereof, in an amount sufficient to lower said blood glucose level in said hyperglycemic mammal.

4,511,577

DERIVATIVES OF BENZOIC ACID

Graziella Bruno, Milan, Italy, assignor to Media Research s.r.l., Milan, Italy

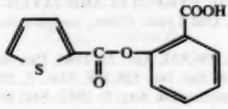
Filed Mar. 13, 1984, Ser. No. 589,126

Claims priority, application Italy, Mar. 23, 1983, 20235 A/83

Int. Cl.³ A61K *31/38;* C07D *333/24*

U.S. Cl. 514—448 **4 Claims**

1. 2-(2-Thenoyloxy)-benzoic acid of formula (I):



and pharmaceutically acceptable salts thereof.

4,511,578

ACYCLAMIDOSULFENYLCARBAMATES FOR CONTROLLING INSECTS

Jozef Drabek, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

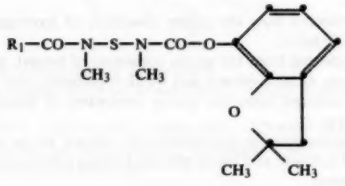
Filed Mar. 23, 1983, Ser. No. 478,004

Claims priority, application Switzerland, Mar. 31, 1982, 1981/82

Int. Cl.³ A01N *47/24*; C07D *307/86*

U.S. Cl. 514—469 **16 Claims**

1. A compound of the formula



wherein R_1 is straight-chain or branched-chain C_2–C_4-alkyl or cyclopropyl.

14. A method of controlling insects, which method comprises applying thereto or to the locus thereof an insecticidally effective amount of a compound according to claim 1.

4,511,579

PEST REPELLANT

George L. Rotramel; Daniel P. Veilleux, both of Raleigh, and Joseph L. Allen, Durham, all of N.C., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 248,247, Mar. 27, 1981, abandoned. This application Nov. 8, 1983, Ser. No. 549,747

Int. Cl.³ A01N *47/10*

U.S. Cl. 514—490 **6 Claims**

1. A process for reducing damage to agriculturally important products by bird or mammal pests, by including an aversion response to said products in said pests, which comprises contacting said pests while in their natural habitat with a bird or mammal aversion amount of at least one trialkylphenyl alkylcarbamate, wherein said alkyls have from 1–4 carbon atoms which has been applied to said products.

4,511,580

DRUG FOR STIMULATING HEPATIC CELL HOMEOSTASIS AND FOR RESTORING THE FUNCTIONAL CAPACITY OF THE HEPATOCYTES

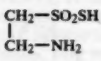
René Moreuil, Paris, France, assignor to Arconthorn Limited, London, England

Continuation of Ser. No. 439,181, Nov. 4, 1982,. This application Jun. 21, 1984, Ser. No. 623,215

Int. Cl.³ A61K *31/185*

U.S. Cl. 514—578 **3 Claims**

1. A pharmaceutical composition adapted for internal administration to a host comprising amino-ethanethiosulphonic acid of the formula:



or a pharmaceutically acceptable salt thereof, and a non-toxic pharmaceutically acceptable carrier, diluent or excipient.

4,511,581

FUNGICIDAL INDANYLBENZAMIDE

Tadashi Ohsumi, Fanabashi; Satoru Inoue, Takarazuka, and Kiyoto Maeda, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

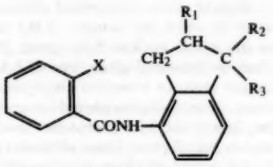
Filed Feb. 8, 1983, Ser. No. 464,864

Claims priority, application Japan, Feb. 10, 1982, 57-20321

Int. Cl.³ A01N *37/18*; C07C *103/76*

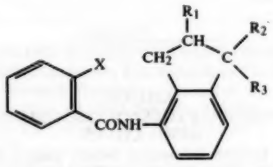
U.S. Cl. 514—617 **10 Claims**

1. A compound of the formula:



wherein X is a lower alkyl, nitro or trifluoromethyl group or a halogen atom, and R_1, R_2, and R_3, which are same or different, each represents a hydrogen atom or a lower alkyl group.

2. A fungicidal composition which comprises a fungicidal amount of a compound of the formula:



wherein X is a lower alkyl, nitro or trifluoromethyl group or a halogen atom, and R_1, R_2, and R_3, which are same or different, each represents a hydrogen atom or a lower alkyl group, and a carrier or diluent.

4,511,582

PHENANTHRENE DERIVATIVES

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jun. 1, 1983, Ser. No. 499,856

Int. Cl.³ A01N *33/02*; C07C *67/03*

U.S. Cl. 514—654 **5 Claims**

1. A method of reducing the number of susceptible tumor cells which comprises contacting said tumor cells with an effective amount of 2-methyl-2-((9-phenanthrylmethyl)amino-1,3-propanediol, or a pharmaceutically acceptable salt thereof, or 2-methyl-2-((2-phenanthyrlmethyl)amino)-1,3-propanediol, or a pharmaceutically acceptable salt thereof.

2. A compound which is 2-methyl-2-((9-phenanthrylmethyl-)amino)-1,3-propanediol or a C_{1-6} alkylcarboxylic acid ester derived therefrom or a pharmaceutically acceptable acid addition salt thereof.

4,511,583

FRIED FOODS OF REDUCED OIL ABSORPTION AND METHODS OF PREPARATION EMPLOYING SPRAY OF FILM FORMING AGENT

Sharon Olson, St. Paul, and Robert Zoss, Minneapolis, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Jul. 18, 1983, Ser. No. 514,982
Int. Cl.[3] A23L *1/01*
U.S. Cl. 426—89 22 Claims

1. A process for preparing a battered and breaded fried food item with reduced oil absorption, wherein the weight ratio of combined batter and breading to said food item ranges from about 0.25:1 to 1.2:1, comprising:

A. applying to said battered and breaded food item an aqueous solution containing from about 10% to 35% by weight of the solution of a film forming agent in amounts such that the weight ratio of said agent on a dry basis to said food item ranges from about 0.02:1 to 0.06:1, to form a coated food item, and

B. frying said coated food item in an edible fatty triglyceride having a temperature ranging from about 325° F. to 405° F. for about 15 to 40 seconds to form a fried breaded food item having an oil content of less than about 16% by weight.

4,511,584

PARTICULATE FOOD ACIDULANT

Phillip J. Percel, Parma, and Douglas W. Perkins, Medina, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed May 31, 1983, Ser. No. 499,353
Int. Cl.[3] A23L *1/221*
U.S. Cl. 426—99 11 Claims

1. A particulate food acidulant consisting essentially of lactic acid plated onto particulate calcium lactate carrier in a weight ratio of lactic acid (as anhydrous) to carrier of about 1:1 to about 3:2, and a water insoluble hard, edible, lipid coating substantially encapsulating said carrier and acid in an amount effective to prevent substantial release of acid from said acidulant before said lipid coating melts.

4,511,585

STORAGE STABLE, READY-TO-EAT BAKED GOODS

Jack R. Durst, Champlin, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 388,069, Jun. 14, 1982, Pat. No. 4,456,625. This application May 6, 1983, Ser. No. 489,661
The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.
Int. Cl.[3] A21D *10/02, 13/00*
U.S. Cl. 426—106 33 Claims

1. A lower moisture, storage stable, crumb-structured, ready-to-eat, cooked good, said cooked good being made from a flour containing base batter or dough mix, water, and about 5% to about 15% by weight of said cooked good of a liquid edible polyhydric alcohol said batter or dough mix having a water activity level sufficiently low to provide a high quality long shelf life cooked good:

the water activity level (AW) of said cooked good being equal to or less than 0.85,

the ratio of water of said cooked good to liquid polyhydric alcohol being equal to or less than 4.8, and

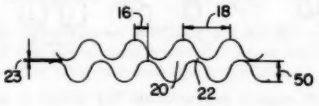
the ratio of starch present in the flour of said cooked good to liquid polyhydric alcohol being equal to or less than 3.95.

4,511,586

POTATO PRODUCT WITH OPPOSITE PHASE-SHIFTED CORRUGATIONS OF THE SAME FREQUENCY AND AMPLITUDE

Margaret Fitzwater, Lewisville, and Lewis C. Keller, Watauga, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Aug. 3, 1983, Ser. No. 519,986
Int. Cl.[3] A23L *1/212, 1/216;* A23P *1/00*
U.S. Cl. 426—144 6 Claims



1. A food product comprising a potato slice or potato dough sheet having substantially parallel corrugations on opposite surfaces thereof, said corrugations having substantially the same frequency and amplitude, wherein the corrugations on one surface are phase shifted with respect to the corrugations on the opposite surface by about ¼ of the pitch distance of the corrugations.

4,511,587

ENZYME INACTIVATED HOPS

Robert C. Menary, Taroona, and Peter E. Doe, Sandy Bay, both of Australia, assignors to The University of Tasmania, Tasmania, Australia

Filed Jan. 5, 1983, Ser. No. 455,737
Claims priority, application Australia, Jan. 7, 1982, PF2201
Int. Cl.[3] C12C *3/00;* A23L *3/16, 3/34*
U.S. Cl. 426—271 2 Claims

1. A process for treating hops which comprises heating fresh hops to a temperature of at least 80° C. and maintaining said hops at a temperature of at least 80° C. for one to two hours to reduce or halt α-acid oxidase enzyme activity in said hops.

2. A process for treating hops according to claim 1 which further comprises mixing said hops with ethylene-diamine-tetra-acetic acid in an amount effective to halt or significantly reduce the activity of α-acid oxidase enzyme.

4,511,588

PRESERVABLE GRANULAR TOFU (SOYBEAN CURD) AND THE PROCESS OF PRODUCTION THEREOF

Shiro Kudo, Shizuoka, and Mitsuyoshi Hayashi, Nagano, both of Japan, assignors to Asahi-Matsu Foods Inc., Nagano and Mitsubishi Corporation, Tokyo, both of, Japan

Filed Apr. 20, 1983, Ser. No. 486,702
Int. Cl.[3] A23J *3/00;* A23L *1/20*
U.S. Cl. 426—302 4 Claims

1. A process for producing granular tofu free from water liberation comprising preparing soybean milk or soybean protein paste from whole or defatted soybeans, adding to said milk or paste a coagulator selected from the group consisting of calcium salts, magnesium salts and glucono-delta-lactone, pouring the mixture into heated oil at temperature between above 75° C. and below 140° C. to obtain a granular particulate product having a surface coated with oily film.

4,511,589

PASTEURIZATION OF EGGS

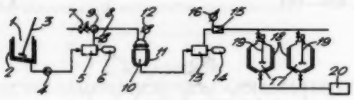
Yvan Padly, La Tour-de-Peilz, and Roger Borgeaud, Vevey, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Apr. 8, 1983, Ser. No. 483,129
Int. Cl.[3] A23L *3/00;* F28F *17/00*
U.S. Cl. 426—521 8 Claims

1. A process for the continuous pasteurisation of eggs comprising:

(a) passing liquid egg material under a superatmospheric operating pressure through a first scraped surface heat exchanger to raise the temperature of the egg material to the pasteurisation temperature;

(b) passing the heated egg material to a heated holding vessel under pressure of a sterile inert gas for a period of time



which ensures pasteurisation but which is sufficiently short to ensure that substantially no coagulation occurs; and then

(c) passing the pasteurised egg material through a second scraped surface heat exchanger where it is cooled to a temperature below 10° C. over a period of time of less than 5 minutes.

4,511,590

LOW-LACTOSE, LOW-GALACTOSE IMITATION MILK PRODUCT

Marion J. Caldwell, 510 Palo Verde Dr., Leesburg, Fla. 32748

Continuation-in-part of Ser. No. 303,043, Sep. 17, 1981, abandoned. This application May 17, 1983, Ser. No. 495,441

Int. Cl.³ A23C *9/00, 9/15*

U.S. Cl. 426—580 **13 Claims**

1. A low-lactose, low-galactose imitation milk product for human consumption wherein the essential ingredients other than added water are: a major quantity of from about 12% to about 18% by weight of undenatured, washed and drained cottage cheese curds; from about 1.0% to about 5.0% by weight of an edible fat or oil; a minor quantity of a substance providing nutritional calcium; a minor quantity of a suspending substance that serves as a stabilizer or emulsifier in the presence of added water; a minor quantity of a sweetener other than lactose or galactose; and a minor quantity of at least one additional palatability-imparting substance.

4,511,591

SPREADABLE FAT PRODUCT AND METHOD FOR ITS PRODUCTION

Kenneth L. Andersson, Sandby, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

PCT No. PCT/SE82/00210, § 371 Date Feb. 9, 1983, § 102(e) Date Feb. 9, 1983, PCT Pub. No. WO83/00005, PCT Pub. Date Jan. 6, 1983

PCT Filed Jun. 11, 1982, Ser. No. 467,485

Claims priority, application Sweden, Jun. 25, 1981, 8103998

Int. Cl.³ A23D *3/00, 3/02*

U.S. Cl. 426—603 **8 Claims**

3. A method of manufacturing a fat product which is spreadable at refrigerator temperature and which is free of additives in the form of stabilizing agents and emulsifiers, said method comprising the steps of pasteurizing milk at 85–95° C., cooling and then ultra-filtrating the pasteurized milk to provide a protein concentrate, mixing said concentrate with fat and water to form a mixture containing 35–55% fat, 4–7% protein and 41–58% water, and forming an oil-in-water emulsion by subjecting said mixture to homogenization, said homogenization being sufficient to reduce said fat to spheres each smaller than 10μ and surrounded by shells of said protein to stabilize the emulsion.

4,511,592

PREPARATION OF ACIDULATED MEAT EMULSIONS

Phillip J. Percel, Parma; Douglas W. Perkins, Medina, and Anthony V. Petricca, Rocky River, all of Ohio, assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 356,940, Mar. 11, 1982,. This application Jun. 20, 1984, Ser. No. 622,506

Int. Cl.³ A23L *1/31*

U.S. Cl. 426—646 **5 Claims**

1. A method for preparation of acidulated meat emulsions comprising the steps of

(a) emulsifying a meat source;

(b) mixing with said meat source during emulsification a preserving and/or texturizing amount of a particulate meat acidulant consisting essentially of a solid acid core particle having a continuous, substantially impervious coating thereon, said coating being a water soluble, film-forming, edible, bland, starch hydrolysate or protein, said starch hydrolysate or protein having a water solubility sufficient to produce a pumpable solution at about 20–40% solids concentration, based on solution weight;

said acidulant being substantially non-agglomerated and having a particle size not substantially in excess of about 20 mesh, U.S. Standard Sieve;

the ratio of said solid acid core particle to said coating being in the range of about 90–50:10–50;

said coating being spray applied to said solid acid core particle in a fluid bed spray applicator.

4,511,593

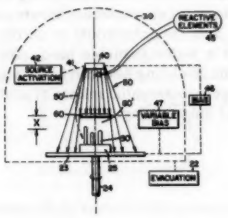
VAPOR DEPOSITION APPARATUS AND METHOD

Henry E. Brandolf, Inver Grove Heights, Minn., assignor to Multi-Arc Vacuum Systems Inc., Saint Paul, Minn.

Filed Jan. 17, 1983, Ser. No. 458,011

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—37 **21 Claims**



1. Vapor deposition apparatus, comprising:

(a) evacuation chamber means defining a deposition chamber suitable for evacuation of the chamber down to at least 2×10^{-3} torr.;

(b) means disposed in said chamber for supplying a source of coating material;

(c) means operative upon said source of coating material for converting said source material into a plasma of particles eminating outwardly from said source;

(d) means for supporting a substrate of the type having at least one surface area suitable for receiving and for being coated by said plasma of coating material;

(e) deflection shield means operatively disposed in said chamber between said source and said substrate supporting means for blocking movement of a majority of those said plasma particles traveling in a line-of-sight direction from said source to said supported substrate, wherein said blocked plasma particles strike and impart kinetic energy to said shield means, thereby heating said shield means; whereby said one substrate surface is primarily coated by said plasma particles that diffuse around said shield means; and

(f) wherein said shield means and said substrate support

means are spaced and arranged relative to one another such that said heat from said shield means radiates to and operatively heats said supported substrate.

19. A method of vapor depositing a coating material on a substrate surface within a vacuum chamber in a manner which preserves pre-coating lap finish dimensions of the substrate surface, comprising the steps of:

(a) introducing a coating source material and a substrate to be coated by said source material into a vapor deposition chamber;

(b) placing a shield member within said vacuum chamber between said source material and said substrate such that said substrate lies in a shadow region of said shield member formed in a line of sight direction from said source;

(c) evacuating said chamber to a pressure of at least 2×10^{-3} torr;

(d) generating a plasma of particles from said coating source material, said plasma particles comprising at least atoms, ions, molecules and agglomerates of molecules of said coating source material;

(e) directing a high energy stream of said plasma particles outward from said source material and toward said shield;

(f) bombarding said shield member with said high energy plasma stream particles, thereby imparting kinetic energy which heats said shield member, and thereby blocking movement of a majority of said agglomerates of molecules traveling in a line of sight direction from said source from reaching said substrate;

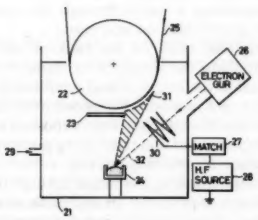
(g) heating said substrate by said kinetic energy created heat radiated from said shield member; and

(h) coating a surface of said substrate primarily with said atoms and molecules of said plasma stream that diffuse around said shield means in a manner that substantially preserves the pre-coating lap finish dimensions of said coating surface.

4,511,594
SYSTEM OF MANUFACTURING MAGNETIC RECORDING MEDIA

Akio Yanai, and Ryuji Shirahata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 18, 1983, Ser. No. 459,021
Claims priority, application Japan, Jan. 28, 1982, 57-12282
Int. Cl.³ C23C *13/08*
U.S. Cl. 427—38 **12 Claims**



1. A method of manufacturing a magnetic recording medium in a vacuum chamber in which magnetic metal or alloy is heated and evaporated by an electron beam gun so that a vacuum-evaporated magnetic film is formed on a non-organic or organic macromolecular base, comprising the steps of:

disposing a plasma generating coil near an evaporation source,

generating an electron beam that passes through a hollow portion of said coil and strikes said magnetic metal or alloy in said evaporation source, and

applying high frequency power to said coil, whereby vacuum deposition is carried out with a plasma thus generated.

7. An apparatus for manufacturing a magnetic recording medium comprising:

means to convey a base material through a vacuum chamber;

means adapted to hold an evaporation source containing a magnetic;

a metal or alloy in said evaporation source;

a plasma generating coil disposed proximate to said evaporation source;

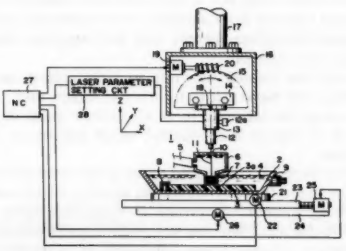
an electron beam gun from which an electron beam is emitted to pass through a hollow portion of said coil and strikes the magnetic metal or alloy in said evaporation source;

a source of high frequency to actuate said coil and generate a plasma whereby vacuum deposition of evaporated magnetic metal or alloy onto said base is effectuated.

4,511,595
LASER-ACTIVATED CHEMICAL-DEPOSITING METHOD AND APPARATUS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Continuation of Ser. No. 433,832, Oct. 12, 1982, abandoned.
This application Jun. 1, 1984, Ser. No. 616,793
Claims priority, application Japan, Oct. 12, 1981, 56-160893
Int. Cl.³ B05B *5/00*; B05D *3/06*
U.S. Cl. 427—43.1 **40 Claims**



1. A method of chemically depositing a metal onto a substrate, comprising the steps of:

flushing in a dynamic flow a liquid solution containing said metal in contact with said substrate;

irradiating a localized area on said substrate with a narrow energy light beam through said flushing liquid solution while maintaining the thickness thereof traversed by said light beam incident upon the localized area to be less than 5 cm, thereby activating an interface between said area and said flushing liquid solution to allow said metal to be chemically deposited therefrom selectively onto said area; and

automatically displacing said light beam and said substrate in a predetermined scanning manner such as to shift said localized area of interception of said incident light beam successively over a desired surface region of said substrate whereby said metal is sequentially deposited on said surface region.

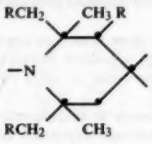
4,511,596
PROCESS FOR THE ELECTRON BEAM CURING OF COATING COMPOSITIONS

Godwin Berner, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,166
Claims priority, application Switzerland, Jan. 20, 1983, 319/83
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—44 **8 Claims**

1. A process for curing coating compositions, which contain

ethylenically unsaturated compounds, by electron beam irradiation with the addition of a curing accelerator, which comprises using as the curing accelerator at least one 2,2,6,6-tetraalkylpiperidine derivative which, in its molecule, contains at least one group of the formula I



(I)

in which R is hydrogen or methyl.

4,511,597

METHOD FOR DEPOSITING A METAL ON A SURFACE

Yu-Ling Teng, Douglaston, and Richard Mayernik, North Merrick, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Oct. 12, 1983, Ser. No. 541,048
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—53.1 **19 Claims**

1. In a method for making conductive metal patterns by treating a substrate with a solution comprising a reducible salt of a non-noble metal and a light radiation sensitive reducing compound selected from quinones, benzoquinones, anthraquinones and derivatives thereof, and anthraquinone disulfonic acids and salts thereof;

exposing the treated substrate to light radiant energy to reduce the metal salt to form a real image; and

immersing the substrate in an electroless metal deposition bath to deposit a conductive metal pattern on the real image;

the improvement comprising treating the exposed substrate, prior to electrolessly depositing metal in a fixed bath with a fixing solution comprising a complexing agent for the non-noble metal wherein as a result of said treatment, light sensitive reducing compound builds up in the bath;

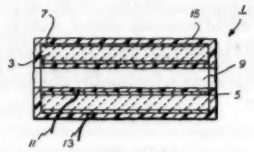
said fixing solution being maintained so that the concentration of the light sensitive reducing compound in the fixing solution does not exceed 0.4 m moles/liter.

4,511,598

ELECTROMECHANICAL TRANSDUCER PROTECTING

Linda T. Creagh, Argyle, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 4, 1982, Ser. No. 432,593
Int. Cl.³ B05D *5/12*
U.S. Cl. 427—58 **1 Claim**



1. A method for overcoating and impregnating an electroded porous electromechanical transducer comprising the steps of:

(a) immersing said electroded porous electromechanical transducer in a container of insulating hardenable liquid,

(b) subjecting said container to a reduced pressure until at least a portion of gases entrained in the voids of said porous electromechanical transducer are removed,

(c) increasing the pressure on said container,

(d) removing said transducer from said liquid,

(e) allowing excess liquid to drain off of said transducer,

(f) allowing said hardenable liquid to harden until a protective coating is formed on said transducer

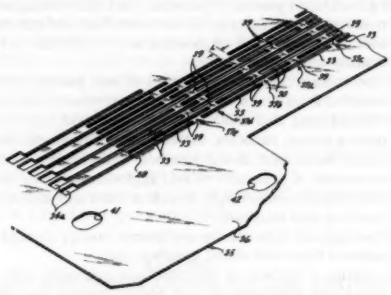
---

4,511,599

MASK FOR VACUUM DEPOSITING BACK METAL ELECTRODES ON EL PANEL

Sam H. Rustomji, Camarillo, Calif., assignor to Sigmatron Associates, Los Angeles, Calif.

Filed Mar. 1, 1983, Ser. No. 470,935
Int. Cl.³ B05D *5/12, 1/32*
U.S. Cl. 427—66 **6 Claims**



1. A method of depositing counter metal electrodes on the back of a glass substrate already having thereon a thin-film structure including front transparent electrodes and an electroluminescent layer sandwiched between dielectric layers, said method comprising:

providing a flexible steel mask with a plurality of long parallel closely spaced filaments having spacings corresponding to the width of the back metal electrodes to be deposited on said substrate, and having reinforcing portions bridging the spacings between the filaments for reducing the free length portions of the filaments;

positioning said mask on the back of said substrate while holding said filaments and said reinforcing portions flush against the substrate by a magnet;

vacuum depositing a metal through the spacings of said filaments as provided on said mask;

repositioning said mask on the back of said substrate by shifting it along the length of its filaments at least a distance equal to the length of said reinforcing portions so as to position said reinforcing portions over the areas of the substrate that have already been deposited on while holding said filaments nd said reinforcing portions flush against said substrate by said magnet; and

again vacuum depositing the metal through the spacings of said filaments as provided on said mask so as to complete the forming of said counter metal electrodes on the back of said substrate.

4,511,600

SOLAR CELL METAL SPRAY PROCESS

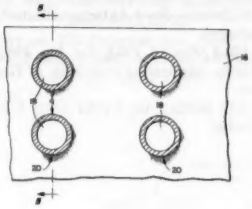
James M. Leas, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.

Filed Feb. 10, 1984, Ser. No. 579,126
Int. Cl.³ H01L *21/283, 31/04*
U.S. Cl. 427—75 **11 Claims**

1. A method of forming a metal pattern on a solar cell, comprising the steps of:

(a) forcing a molten metal through an aligned array of orifices by use of gas pressure;

(b) vibrating the aligned array of orifices to form the molten metal issuing from the orifices into metal droplets;
(c) moving a solar cell collinearly with the aligned array of orifices; and



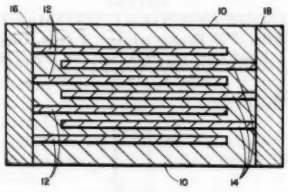
(d) allowing each series of metal droplets from a single orifice to fall onto a specific region of the solar cell to build up a metal layer of increasing thickness, each metal droplet in the metal layer being permitted sufficient time to solidify prior to allowing the next metal droplet to strike the metal layer.

4,511,601

COPPER METALLIZATION FOR DIELECTRIC MATERIALS

James R. Akse, Canyon Country, and Stanley A. Long, Valencia, both of Calif., assignors to North American Philips Corporation, New York, N.Y.

Filed May 13, 1983, Ser. No. 494,475
Int. Cl.³ H05K *3/12*
U.S. Cl. 427—79 **26 Claims**



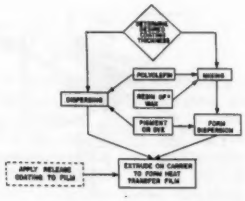
1. A method for providing a copper metallization on a dielectric or semiconductive body, said method consisting essentially of the steps of:
providing copper oxide powder;
providing a reduction-resistant glass frit having a melting temperature;
mixing the copper oxide powder and the glass frit to produce a mixture having at most 15 weight percent glass frit;
dispersing the mixture in an organic vehicle and a solvent for the organic vehicle to produce a paste;
applying the paste to the body to provide a coating thereon;
drying the coating to remove the solvent;
firing the coated body a first time in an oxidizing atmosphere at a temperature below the melting temperature of the glass frit to remove at least a portion of the organic vehicle, said first firing producing substantially no adhesion between the paste and the body; and
firing the coated body a second time after the first firing, the second firing being in an atmosphere which is reducing to the copper oxide, said second firing being at a temperature from 700° to 1050° C. for from 120 to 15 minutes to convert the copper oxide to copper metal and to form a bond between the copper metal and the body.

4,511,602

THERMAL IMPRINTING OF SUBSTRATES

Edward S. Margerum, Salem, and Norman A. Hiatt, Framingham, both of Mass., assignors to Dennison Mfg. Company, Framingham, Mass.

Division of Ser. No. 194,694, Oct. 6, 1980, Pat. No. 4,404,249.
This application Jul. 5, 1983, Ser. No. 510,510
Int. Cl.³ B41M *5/26*
U.S. Cl. 427—148 **12 Claims**



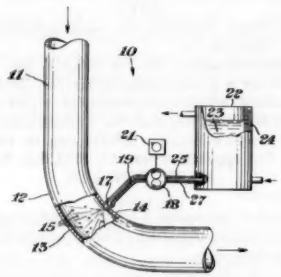
1. The method of producing a heat transfer film comprising forming a single layer heat transfer coating consisting of a uniform blend of a pigmented polyolefin and a rosin ester on a carrier film.

4,511,603

ADDITION OF ADDITIVES TO PLASTICS

Leslie E. Wallace, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 19, 1983, Ser. No. 562,923
Int. Cl.³ B05D *1/02*
U.S. Cl. 427—222 **4 Claims**

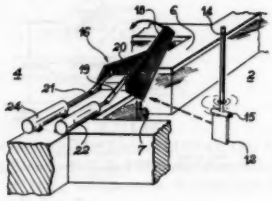


1. An apparatus for the addition of additives to particulate synthetic resins, the apparatus comprising a pneumatic conveyor adapted to convey particulate synthetic resinous thermoplastic material, the pneumatic conveyor having disposed therein at least one elbow, the elbow having an external radius and an internal radius, a spray nozzle disposed at the inside radius and adapted to spray said additive into the conveyor generally toward the outside radius of the elbow, a pump in operative communication with said nozzle therewith, a vessel for the containment of liquid additive in communication with the pump.

4,511,604
PROCESS AND APPARATUS FOR PRODUCING ALTERNATE MONOMOLECULAR LAYERS

André Barraud, Bures-sur-Yvette, and Jean Leloup, Gif sur Yvette, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 29, 1984, Ser. No. 584,918
Claims priority, application France, Mar. 4, 1983, 83 03578
Int. Cl.³ B05C 3/12; B05D 1/20
U.S. Cl. 427—402 10 Claims



1. A process for the production of alternate monomolecular layers on at least one substrate, of the type in which the substrate is passed through the surface of a liquid contained in a vessel and over which has previously been spread a monomolecular layer of a given substrate, wherein the vessel is subdivided into at least two compartments, a monomolecular layer is deposited on the surface of the liquid contained in each of these compartments the latter being arranged in such a way that there can be no contact there between the monomolecular layers located in each of them and the substrate is alternately passed from one compartment to the other, transfer solely taking place within the liquid, or solely above the latter, or alternatively within the liquid or above the surface thereof.

4,511,605
PROCESS FOR PRODUCING POLISHING PADS COMPRISING A FULLY IMPREGNATED NON-WOVEN BATT

John R. McCartney, Westtown, Pa., assignor to Norwood Industries, Inc., Malvern, Pa.

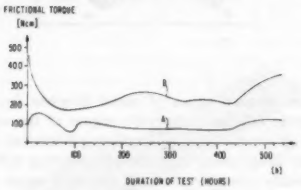
Continuation-in-part of Ser. No. 500,015, Jun. 7, 1983, abandoned, which is a continuation of Ser. No. 306,946, Sep. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 188,330, Sep. 18, 1980, Pat. No. 4,342,805, which is a continuation-in-part of Ser. No. 188,329, Sep. 18, 1980, Pat. No. 4,376,148. This application Nov. 17, 1983, Ser. No. 552,713
Int. Cl.³ B05D 5/00
U.S. Cl. 427—246 16 Claims

1. A method of producing a polishing pad comprising:
uniformly fully impregnating a fibrous batt with an aqueous polymer dispersion;
coagulating the dispersion within the fully impregnated batt to form an impregnated composite;
simultaneously drying the impregnated composite;
applying pressure to the impregnated composite and heating at least one surface thereof to form a composite in which the polymer is fused to itself and the at least one heated surface becomes denser and suitably smooth and flat to comprise a polishing surface; said composite having a bulk density at the polishing surface approaching the actual density while maintaining porosity throughout the structure; and
applying an adhesive to a surface opposing the polishing surface to form a polishing pad.

4,511,606
METHOD FOR INCREASING THE ENDURANCE AND REDUCING THE FRICTION OF OIL LUBRICATED CONICAL ROLLER BEARINGS

Willibald Ehrlich, Schorndorf; Hans Jooss, Stuttgart, and Rainer Hornung, Schlierbach, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 13, 1983, Ser. No. 494,363
Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218145
Int. Cl.³ B05D 3/02; C10M 5/02, 7/04, 7/16
U.S. Cl. 427—386 5 Claims



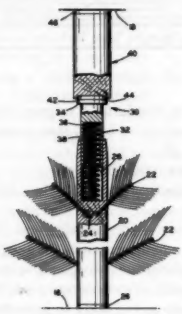
1. A method for increasing endurance and reducing friction of high-precision, oil lubricated conical bearings comprising:
(a) coating guide surfaces of the conical bearings with a lubricating paint containing a solid lubricant, the paint being insoluble in oil and the thickness of the coating being less than about 8 μm, then
(b) drying the guide surfaces.

4. The method according to claim 1, further comprising applying a lubricating paint dispersed in a binder including phenol resins, melamine resins, epoxide resins, or alkyl polyester resins.

4,511,607
WINDOW-MOUNTED CHRISTMAS TREE

John D. White, 3705 Brunswick Dr., Toledo, Ohio 43606

Filed Apr. 11, 1984, Ser. No. 599,274
Int. Cl.³ A47G 33/06
U.S. Cl. 428—13 17 Claims



1. In combination, a window comprising a transparent pane, a lower member below said pane having a horizontal surface facing upwardly, and an upper member above said pane having a horizontal surface facing downwardly, an artificial Christmas tree comprising an upright supporting member having a lower end engaging the horizontal surface of said lower member, a plurality of artificial tree branches engaging said upright supporting member and extending outwardly therefrom, said plurality of artificial tree branches extending, in part, generally parallel to said transparent pane and extending, in part, transversely substantially only away from said transparent pane,

and an extension member mounted on an upper end of said upright supporting member and movable upwardly toward the horizontal surface of said upper member.

4,511,608

ARTIFICIAL NAIL MOUNTING, REINFORCEMENT, AND METHOD

Charlotte L. Ferraro, 236 Paterson Ave., Lodi, N.J. 07644

Filed Dec. 7, 1982, Ser. No. 432,324

Int. Cl.³ A45D *31/00*

U.S. Cl. 428—15 **13 Claims**

1. A method for providing a disposable and replaceable artificial nail mounting tab and reinforcement for permitting reuse of said nail until it wears out and for facilitating the securing to and removal from a natural nail of said artificial nail, comprising the steps of:

(1) shaping an appropriate double-sided, pressure-sensitive adhesive material to form a tab for covering a substantial portion of the area of the outside surface of a human or natural nail, upon which it is desired to mount an artificial nail;

(2) securing one side of said tab to the outer surface of said human or natural nail;

(3) positioning an artificial nail over the other side of said tab and said natural nail; and

(4) pressing said artificial nail onto said natural nail, for securely mounting said artificial nail to said natural nail via the adhesive on the other side of said tab.

4,511,609

MULTILAYER TRASH BAG FILM

Joseph N. Craver, Flossmoor, and Jerome T. Horner, Indian Head Park, both of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1982, Ser. No. 429,184

Int. Cl.³ B32B *7/02, 27/08;* B28B *3/20*

U.S. Cl. 428—35 **14 Claims**

1. A method of preparing a multilayer film comprising coextruding a first outer layer consisting essentially of low pressure, low density polyethylene copolymer formed from ethylene and a comonomer selected from butene-1, pentene-1, hexene-1, heptene-1 and octene-1, and mixtures thereof, said copolymer having a melt index of between about 0.5 and about 3.0 decigrams per minute, and a density of between about 0.916 and about 0.930 grams per cubic centimeter, a core layer consisting essentially of high pressure, low density polyethylene, and a second outer layer consisting essentially of high pressure, low density polyethylene, said high pressure, low density polyethylene having a melt index of between about 0.5 and about 5.0 decigrams per minute and a density of between about 0.916 and about 0.930 grams per cubic centimeter.

4,511,610

MULTI-LAYER DRAWN PLASTIC VESSEL

Jinichi Yazaki, Tokyo, and Kozaburo Sakano, Kawasaki, both of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Filed Sep. 29, 1983, Ser. No. 536,846

Claims priority, application Japan, Oct. 14, 1982, 57-179051; Nov. 2, 1982, 57-191809

Int. Cl.³ B65D *85/00;* B32B *27/08*

U.S. Cl. 428—35 **8 Claims**

1. A multi-layer drawn plastic vessel comprising at least one layer comprising at least one crystalline olefin resin selected from the group consisting of crystalline polypropylene and crystalline propylene/ethylene copolymers having an ethylene content of 1 to 20 mole %, at least one oxygen-barrier layer comprising an ethylene/vinyl alcohol copolymer having an ethylene content of 25 to 60 mole %, and an adhesive resin layer interposed between said two resin layers, said adhesive resin layer comprising an acid- or acid anhydride—modified, linear, low-density polyethylene and said crystalline olefin resin layer being molecularly oriented in at least one direction.

4,511,611

CABLE SLEEVE LINER

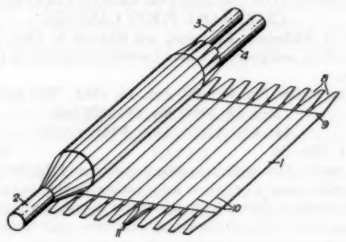
Marc F. L. Moisson, Strombeek, Belgium, assignor to N.V. Raychem S.A., Belgium

Continuation of Ser. No. 425,296, Sep. 28, 1982, abandoned, which is a continuation of Ser. No. 094,815, Nov. 16, 1979, Pat. No. 4,380,686. This application Dec. 20, 1983, Ser. No. 563,271

Claims priority, application United Kingdom, Sep. 11, 1979, 7931402

Int. Cl.³ B32B *15/20*

U.S. Cl. 428—35 **25 Claims**



1. A cable sleeve liner capable of being wrapped around a cable splice to support a heat-recoverable sleeve which shrinks over said cable sleeve liner when subjected to heat, said cable sleeve liner comprising a laminate including at least one layer of fibrous, non-woven cellulosic sheet material positioned between a metal layer which is substantially impermeable to moisture vapour and a first substantially vapour-permeable layer formed from flexible vapour-permeable polymeric film material, said flexible vapour-permeable polymeric film material having sufficient vapour permeability to permit substantial escape of vapors and gases generated within the laminate during the application of heat to the heat-recoverable sleeve.

4,511,612

MULTIPLE-LAYER WALL FOR A HOLLOW BODY AND METHOD FOR MANUFACTURING SAME

Werner Hüther, and Axel Rossmann, both of Karlsfeld, Fed. Rep. of Germany, assignors to Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 20, 1982, Ser. No. 410,059

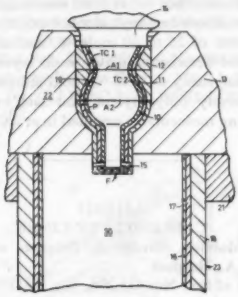
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 3133209

Int. Cl.³ F16M *1/00*

U.S. Cl. 428—36 **15 Claims**

1. A casing subjected to hot gases such as combustion gases of an engine and comprising a hollow body including a three-layer composite wall having a load side, said wall including a ceramic inner layer bounding said load side and an outer retaining layer of fiber-reinforced material or metal confining said inner layer, and further comprising an intermediate layer

of thermally insulating ceramic material between said inner and retaining layers, said intermediate layer being shrinkfitted



or sintered on to the inner layer, said retaining layer compressively prestressing said inner layer.

4,511,613

METHOD FOR INHIBITING DISCOLORATION ON CELLULOSE FOOD CASINGS

Myron D. Nicholson, Lockport, and Herman S. Chiu, Chicago, both of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 466,302, Feb. 14, 1983,. This application Jun. 27, 1984, Ser. No. 625,364

Int. Cl.³ A22C *13/00*; **F16L** *11/00*

U.S. Cl. 428—36 **32 Claims**

1. A method for inhibiting discoloration and the formation of black spots upon a cellulose food casing treated with a liquid smoke solution derived from natural wood and containing smoke color, odor and flavor constituents, said method comprising contacting said casing with an agent having the ability to prevent the progressive oxidation of metals, said agent being selected from the group consisting of a coordination compound and a reducing agent, wherein said reducing agent is selected from the group consisting of hydrogen sulfide, sulfur dioxide, and sodium hydrosulfite.

4,511,614

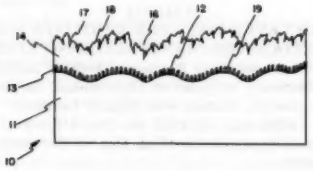
SUBSTRATE HAVING HIGH ABSORPTANCE AND EMITTANCE BLACK ELECTROLESS NICKEL COATING AND A PROCESS FOR PRODUCING THE SAME

Richard L. Greeson, Longmont, and George I. Geikas, Boulder, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Oct. 31, 1983, Ser. No. 546,780

Int. Cl.³ B32B *3/26*; **B05D** *5/06*; **C23C** *1/10*; **C23F** *5/02*

U.S. Cl. 428—141 **19 Claims**



1. A blackened substrate which comprises a substrate coated with at least two different nickel-phosphorus alloys, said substrate having a dense array of microscopic as well as macroscopic pores etched into the surface having a spectral reflectance of less than about 5 percent at wavelength of radiant energy from about 0.3 to about 40 microns wherein the lowermost alloy layer comprises about 95% to 96% nickel and about 4% to 5% phosphorus and the uppermost alloy coating contains 92% to 93% nickel and about 7% to 8% phosphorus.

5. A method for producing a highly blackened surface, having high light absorption and high emissivity capabilities on a substrate, said method comprising

(a) surface conditioning said substrate so as to provide a roughened, non-smooth surface,

(b) immersing the thus surface-roughened substrate in a first electroless plating bath having a low phosphorus to nickel concentration wherein said first electroless plating bath has a phosphorus content of about 4 to 5 weight percent based on the total weight of said bath so as to deposit a first electroless nickel-phosphorus alloy coating on said surface-roughened substrate,

(c) immersing said coated substrate from said (b) in a second electroless plating bath having a phosphorus to nickel concentration higher than that of said first electroless plating bath wherein said second electroless plating bath has a phosphorus content of about 7 to 8 weight percent based on the total weight of said bath so as to deposit a second electroless nickel-phosphorus alloy coating which is superimposed directly on said first electroless nickel-phosphorus alloy coating,

(d) immersing the electroless nickel-phosphorus alloy coated substrate resulting from step (c) into an aqueous acidic etchant bath containing about 0.1 to about 2.0 weight percent divalent nickel, about 2 to 3 weight percent sulfuric acid and about 45 to 49 weight percent nitric acid for a period of time effective to develop a highly blankened surface of said substrate and

(e) drying the resulting substrate having said highly blackened surface.

4,511,615

METHOD FOR MANUFACTURING AN ADHESIVE INTERLINING AND FABRIC PRODUCED THEREBY

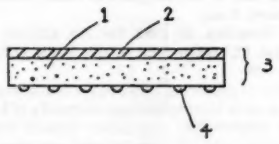
Nobuo Ohta, Showa, Japan, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Dec. 30, 1982, Ser. No. 454,638

Claims priority, application Japan, Feb. 3, 1982, 57-16741

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—198 **9 Claims**



1. A method for manufacturing a soft non-woven fabric having a coating on one side of a heat-melting adhesive having a hot iron softening temperature range, which comprises:

forming a first web layer of about 10 to about 40% by weight of a thermoplastic bicomponent fiber mass, the bicomponent fibers comprising a first low softening temperature range component and a second high softening temperature range component;

forming a second web layer of about 10 to about 50% by weight single component thermoplastic fibers having a softening temperature range equal to or lower than the softening temperature range of said first low softening temperature range component of said bicomponent fibers but at least 20° C. higher than the softening temperature of the heat-melting adhesive;

overlaying the second web on top of the first web;

bonding the first and second webs without compressing them, by heating the webs to a maximum temperature which causes softening of the low softening temperature range component of the bicomponent fibers and the fibers

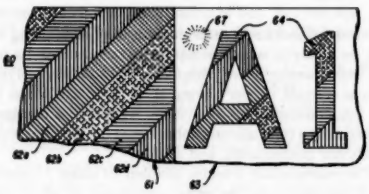
of the second web to produce a bonded fabric having a first web side and a second web side; and

coating the first web side of the bonded fabric with the heat-melting adhesive, to produce the non-woven fabric having an adhesive coating on one side.

4,511,616
ANTICOUNTERFEIT MAGNETIC METALLIZED LABELS

Warren R. Pitts, Needham, and Herbert W. Salit, Ashland, both of Mass., assignors to Dennison Mfg. Company, Framingham, Mass.

Filed Feb. 14, 1983, Ser. No. 466,257
Int. Cl.³ B44C *1/10*; B32B *31/12, 15/02*
U.S. Cl. 428—203 **17 Claims**



1. A metallized security laminate for electrosensitive printing, comprising, in sequence:

a base layer;

a magnetic pattern layer coated onto said base layer;

a decorative background layer coated onto said magnetic pattern layer, said decorative background layer forming a visibly heterogeneous pattern; and

a vapor-deposited metallic surface layer, having a surface resistivity in the range from 1 to 8 ohms per square,

wherein the magnetic pattern layer provides a distinct magnetic pattern along the surface of the metallic layer.

4,511,617
MAGNETIC RECORDING MEDIUM

Shozo Hideyama, Yokohama; Akio Ishizawa, Tokyo; Katuya Kumagai, and Minoru Hashimoto, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 23, 1983, Ser. No. 497,280
Claims priority, application Japan, May 25, 1982, 57-87348
Int. Cl.³ G11B *5/70*; B32B *7/02*
U.S. Cl. 428—412 **13 Claims**

1. A magnetic recording medium which comprises;

a substrate;

a first magnetic layer applied on the surface of the substrate and having an easy axis of magnetization in the in-plane direction of the substrate;

and a second magnetic layer applied on the surface of the first magnetic layer, formed of ferrite series powder represented by the formula:

$$AO.n(Fe_{1-m}M_m)_2O_3$$

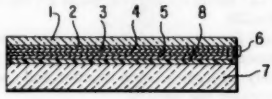
(wherein A is at least one metallic element selected from the group consisting of Ba, Sr, Pb and Ca; M is at least one substituent component selected from the group consisting of Co, Ti, Ni, Mn, Cu, Zn, In, Ge and Nb; m is 0.08 to 0.2; and n is 5.4 to 6.0), and having an easy axis of magnetization in a direction perpendicular to the plane of the substrate;

said first magnetic layer having a surface resistivity of 1×10^2 to $1\times10^8\Omega$.

4,511,618
LAMINATED REFLECTIVE PANELS

Eloi Duchene, Gerpinnes, and Pierre Laroche, Ham-sur-Heure, both of Belgium, assignors to Glaverbel, Brussels, Belgium

Continuation of Ser. No. 370,523, Apr. 21, 1982, abandoned. This application Oct. 24, 1983, Ser. No. 544,810
Claims priority, application United Kingdom, Apr. 24, 1981, 8112661
Int. Cl.³ B32B *7/02, 27/40, 31/00*; G02B *5/08*
U.S. Cl. 428—215 **15 Claims**

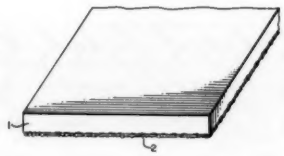


1. A solar reflecting panel forming a component of a solar concentrator, said panel comprising: a glass mirror sheet having a front surface and rear surface and a thickness of less than 2 mm, and coated on its rear surface with a reflective coating; a flat glass backing sheet having a thickness greater than that of said glass mirror sheet; and means constituted by a bonding material bonding said glass backing sheet to said rear surface of said glass mirror sheet to form said sheets into a flat laminate with the drawing direction of said glass mirror sheet being transverse to the drawing direction of said glass backing sheet.

4,511,619
SEALING SHEET OF ELASTOMERIC SYNTHETIC RESINS WITH TEXTILE REINFORCEMENT ON OUTER LAYER

Werner Kuhnel, Neunkirchen-Schoneshof; Peter Pütz, Augustin-Menden; Manfred Simm, Troisdorf, and Paul Spielau, Troisdorf-Eschmar, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 475,520, Mar. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 421,400, Sep. 22, 1982, Pat. No. 4,435,466. This application Aug. 13, 1984, Ser. No. 640,488
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1981, 3150021
Int. Cl.³ B32B *5/08, 17/04*
U.S. Cl. 428—215 **14 Claims**



1. A multi-layered sealing sheet for the building industry comprising at least one outer layer containing elastomeric synthetic resin, which is weldable thermally and/or by solvents or swelling agents, and a textile reinforcing layer bonded to said at least one outer layer by thermal welding, said reinforcing layer being applied to the outside surface of said at least one outer layer of an elastomeric synthetic resin, all of the layers of said sheet containing elastomeric synthetic resin being free of vulcanization accelerator, and containing synthetic resin consisting essentially of an ethylene-propylene-diene terpolymer and/or an ethylene-propylene copolymer and said textile reinforcing layer being formed of synthetic resin fibers and/or glass fibers, having a weight per unit area of 10 to 300 g/m^2, and having interstices into which the heated elastomeric synthetic resin penetrates during said thermal welding to pro-

vide a bond exhibiting a parting strength which is larger than 100 N/5 cm.

4,511,620

METHOD FOR PREVENTION OF BUBBLE FORMATION IN POLYORGANOSILOXANE GELS

Loretta A. Kroupa, and Patricia G. Agbomeirele, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jun. 29, 1984, Ser. No. 625,939
Int. Cl.³ B05D *3/02, 7/24;* B32B *27/08, 27/28*
U.S. Cl. 428—220 **14 Claims**

1. A method for preventing the formation of bubbles at the interface between a polyorganosiloxane gel that is cured by a platinum catalyzed hydrosilation reaction and a substrate, said method comprising the steps of

I. coating said substrate with a first layer comprising an uncured extrudable silicone rubber composition that is compatible with said gel and is curable by a platinum catalyzed hydrosilation reaction to yield a silicone rubber exhibiting a durometer hardness of at least 10 on the Shore A scale, the thickness of said first layer being greater than 3 mm;

II. applying to said first layer a second layer comprising said polyorganosiloxane gel in an uncured form; and

III. curing said first and second layers substantially concurrently to obtain a unitary, cured composite.

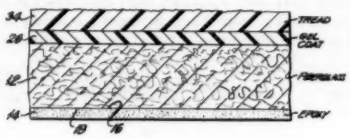
8. A composite consisting essentially of a substrate, a polyorganosiloxane gel composition cured by a platinum catalyzed hydrosilation reaction and a layer of silicone rubber cured by a platinum catalyzed hydrosilation reaction where said layer is in contact with said substrate and separates it from said gel, said silicone rubber and said polyorganosiloxane gel are cohesively bonded, said silicone rubber layer exhibits a thickness of at least 3 mm and where the silicone rubber exhibits a durometer of at least 10 on the Shore A scale.

4,511,621

REPAIR LAMINATE SHEET FOR ACRYLIC AND FIBERGLASS TUBS

Walter Thomas, St. James, and Peter Lucatuorto, Islip, both of N.Y., assignors to Lik-Nu Porcelain, Inc., Hicksville, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,468
Int. Cl.³ B32B *15/00*
U.S. Cl. 428—285 **11 Claims**



1. A laminate repair sheet for fiberglass or acrylic tubs, the sheet comprising:

an upper fiberglass ply; and

a lower epoxy ply its upper surface adhered to the lower surface of said upper fiberglass ply, said lower epoxy ply being substantially the same size and shape as said upper fiberglass ply and being juxtaposed directly below and in registration with said upper fiberglass ply, said upper fiberglass ply and said lower epoxy ply together providing sufficient flexibility to permit said sheet to conform to movement of fiberglass or acrylic tubs, the lower surface of said lower epoxy ply attached to the upper surface of the bottom of a fiberglass or acrylic tub such that said lower epoxy ply overlies and bonds any faults in said bottom.

4,511,622

INTERMEDIATE TRANSFER MEMBER FOR TRANSFERRING TONER IMAGE ON A CARRIER

Ryubun Seimiya; Noriyoshi Tarumi; Masakazu Kokiso, and Hiroshi Tsuchiya, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 279,325, Jul. 1, 1981, abandoned. This application Sep. 24, 1982, Ser. No. 423,050
Claims priority, application Japan, Jul. 18, 1980, 55-98994
Int. Cl.³ B32B *5/16, 9/04*
U.S. Cl. 428—323 **15 Claims**

1. An intermediate transfer member for transferring a toner image on a carrier which comprises a substrate and a transfer layer, said transfer layer comprising an addition polymerization type silicone rubber having an acetone extraction rate of up to 8% containing up to 40% by weight of a condensation polymerization type silicon rubber based on the total weight of the polymer components, and a filler.

6. The intermediate transfer member of claim 1 wherein the filler is selected from the group consisting of silica, calcined clay, calcium carbonate, quartz powder, titanium oxide and zinc oxide.

4,511,623

HIGHLY ORIENTED AROMATIC POLYAMIDE SHORT FIBER

Han S. Yoon, and Tae W. Son, both of Seoul, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, 200-43, Seoul, Rep. of Korea

Filed Aug. 16, 1983, Ser. No. 523,780
Claims priority, application Rep. of Korea, Aug. 30, 1982, 3897/1982[U]
Int. Cl.³ D02G *3/00*
U.S. Cl. 428—359 **8 Claims**

1. A fiber of poly(p-phenyleneterephthalamide) characterized by having:

a pulp-like short fiber form of about 2–100 μm in diameter and about 1,000–50,000 μm in length;

irregular cross-sections in a plane taken perpendicular to the fiber length and needle point-like ends similar to those of natural wood pulp fibers;

an inherent viscosity of at least 5.0 as measured at a concen-

tration of 0.5 g of polymer in 100 ml of 97% concentrated sulfuric acid at 30° C.;

a crystallinity of more than 50%, an orientation angle of less than 25°, and an apparent crystallite size of more than 50 Angstroms, based upon X-ray diffraction pattern data; and

a cross-section with four extinction positions through 360° rotation of a cross-sectional specimen of said fiber, reviewed under crossed polarizers of a polarizing microscope.

4,511,624

ENAMELED WIRES

Munetaka Kawaguchi, Aichi; Hirohiko Nakabayashi, and Masayoshi Miyake, both of Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 75,761, Sep. 17, 1974, abandoned, which is a continuation of Ser. No. 825,731, Aug. 18, 1977, abandoned, which is a continuation of Ser. No. 540,469, Jan. 3, 1975, abandoned. This application Jul. 18, 1983, Ser. No. 514,851

Claims priority, application Japan, Jan. 12, 1974, 49-6873; Jan. 12, 1974, 49-6874; Jan. 12, 1974, 49-6875

Int. Cl.³ B32B *15/00*; H01B *7/00*

U.S. Cl. 428—379 **22 Claims**

1. An insulated enameled wire which exhibits a fusing function to short circuit with adjacent wires due to the provision of an insulating thermoplastic straight chain polyurethane layer thereon which melts fuses at an inside temperature of about 150° to 250° C. without substantially generating smoke thereby permiting short circuiting with adjacent wires, which comprises a conductive wire having coated thereon said insulating thermoplastic straight chain polyurethane layer which is formed by coating a layer consisting essentially of a member selected from the group consisting of the following: components (i) and (ii); components (i) and (iii); or components (i), (ii) and (iii) as defined below;

(i) a polyurethane having a terminal hydroxyl group prepared from at least one aliphatic diol, at least one diisocyanate compound selected from the group consisting of a diisocyanate and a blocked diisocyanate in less than about an equimolar amount of said aliphatic diol;

(ii) a polyurethane having a terminal blocked isocyanate group prepared from at least one diisocyanate compound selected from the group consisting of a diisocyanate and a blocked diisocyanate, at least one aliphatic diol in less than about an equimolar amount of said diisocyanate, and a blocking agent for an isocyanate group; and

(iii) a blocked diisocyanate, wherein at least a portion of said diisocyanate compound in (i), (ii) and (iii) is an aromatic diisocyanate on said conductive wire and then baking the thus coated conductive wire to yield said insulating thermoplastic straight chain polyurethane layer.

4,511,625

PHYSICAL CONVERSION OF LATENT MESOPHASE MOLECULES TO ORIENTED MOLECULES

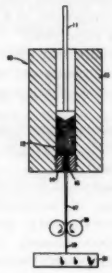
Faramarz Nazem, Strongsville; Rostislav Didchenko, Middleburg Heights, both of Ohio, and David Fink, Stamford, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1982, Ser. No. 429,186

Int. Cl.³ C10C *3/18*; D01F *9/14*; D01D *1/04, 5/08*

U.S. Cl. 428—401 **2 Claims**

1. A pitch fiber having at least 70% mesophase by weight is produced from a spinneret by the steps comprising selecting a petroleum-derived or coal-derived pitch having a mesophase content of less than 40% by weight according to conventional measurements and having a total content of mesophase-type molecules and latent mesophase molecules greater than 70% by weight; and spinning the pitch into a fiber having a diameter less than about 60 microns by passing said pitch through a porous body positioned in a spinneret channel defined between



the inside and outside surfaces of said spinneret to produce said pitch fiber.

4,511,626

ONE-PART MOISTURE-CURABLE POLYURETHANE ADHESIVE, COATING, AND SEALANT COMPOSITIONS

Gerald F. Schumacher, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 9, 1982, Ser. No. 416,301

Int. Cl.³ C08G *18/76*

U.S. Cl. 428—425.6 **20 Claims**

1. Compositions, comprising:

(a) isocyanate-functional prepolymer(s) derived from 4,4'-diphenylmethane diisocyanate (or isocyanate functional derivatives of 4,4'-diphenylmethane diisocyanate) and polyol(s) containing hydroxyl groups about 25 to 100 weight percent of which are primary hydroxyl groups, and

(b) bis[2-(N,N-dialkylamino)alkyl]ether(s), in an amount effective to provide moisture curability of said prepolymer(s).

9. Adhesive, coating, or sealant compositions, comprising a composition according to claim 1, together with filler, solvent, and plasticizer.

12. Cured assemblies, comprising an article and a substrate, with a layer comprising a composition according to claim 1 therebetween.

4,511,627

SANDWICH GLASSES

Itsuo Tanuma, Tokorozawa; Hideo Takeichi, Higashimurayama; Yukio Fukuura, Kawagoe; Tomio Ohyachi, Akigawa, and Kazuo Naito, Kawasaki, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 7, 1982, Ser. No. 433,336

Claims priority, application Japan, Oct. 7, 1981, 56-158723; Nov. 5, 1981, 56-176549

Int. Cl.³ B32B *17/10, 27/30*

U.S. Cl. 428—429 **11 Claims**

1. A sandwich glass comprising glass plates and an intermediate layer interposed therebetween, said intermediate layer being formed by crosslinking a resin composition comprising:

(a) an ethylene-vinyl acetate copolymer having a vinyl acetate content of 15%–50% by weight,

(b) an organic peroxide selected from at least one member of the group consisting of 2-5-, dimethyl-2, 5-di(t-butylperoxy)hexane-3, t-butylcymyl peroxide, 2,5-dimethyl-2, 5-di(t-butylperoxy)hexane, dicumyl peroxide, α,α'bis(t-butylperoxyisopropyl)benzene, n-butyl-4,4-bis(t-butylperoxy)-valerate, 2,2-bis(t-butylperoxy)butane, 1,1-bis(t-butylperoxy)cyclohexane, 1,1-bis(t-butylperoxy)3,3,5-trimethyl cyclohexane and t-butylperoxy benzoate, and

(c) a curing assistant selected from at least one member of

the group consisting of acryloyloxy group-containing compounds, methacryloyloxy group-containing compounds, allyl group-containing compounds and vinyl group-containing compounds wherein said curing assistant is not a silane compound, at a temperature above the melting point of the copolymer.

2. A sandwich glass comprising glass plates and an intermediate layer interposed therebetween, said intermediate layer being formed by photocrosslinking a resin composition comprising:

(a) an ethylene-vinyl acetate copolymer having a vinyl acetate content of 15–50% by weight,

(b) a photosensitizer, and

(c) a curing assistant selected from at least one member of the group consisting of acryloyloxy group-containing compounds, methacryloyloxy group-containing compounds, allyl group-containing compounds and vinyl group-containing compounds wherein said curing assistant is not a silane compound,

under light irradiation during or after heating said resin composition at a temperature above the melting point of the copolymer.

4,511,628

RUBBER ARTICLES HAVING IMPROVED METAL ADHESION AND METAL ADHESION RETENTION EMPLOYING BIS(2-MERCAPTOBENZOTHIAZATO) NICKEL

Jung W. Kang, Clinton, and James A. Davis, Uniontown, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 30, 1984, Ser. No. 575,260

Int. Cl.³ B32B *15/04, 15/08;* **C08K** *5/47, 5/56*

U.S. Cl. 428—457 **4 Claims**

1. A metal-reinforced rubber ply to be used as an element in a manufactured rubber article, said ply having a rubber composition and a plated steel element bonded thereto wherein said rubber composition is made by curing a composition comprising:

a vulcanizable rubber; and

from about 0.5 to about 10.0 parts by weight of a bis(2-mercaptobenzothiazato) nickel per 100 parts of the rubber component in said rubber composition as a promoter of adhesion between said rubber and said plated steel element.

4,511,629

MAGNETIC RECORDING MEDIUM

Ryozo Konno, Omiya; Makio Sugai, Fujimi; Yuichi Kubota; Masaharu Nishimatsu, both of Komoro; Yukihiro Isobe, Usudamachi; Kazushi Tanaka, Komoro, and Osamu Shinoura, Saku, all of Japan, assignors to TDK Electronics Co., Ltd. and Toyo Ink Mfg. Co., Ltd., both of Tokyo, Japan

Filed Feb. 3, 1983, Ser. No. 463,419

Claims priority, application Japan, Feb. 5, 1982, 57-16301; Feb. 5, 1982, 57-16302

Int. Cl.³ H01F *10/00;* **B05D** *5/12*

U.S. Cl. 428—522 **14 Claims**

1. A magnetic recording medium comprising a polyester base, a magnetic coating layer, and a non-magnetic undercoat between said base and said magnetic coating layer, said undercoat comprising a radiation curable coating material which contains at least two types of compounds selected from the group consisting of:

(A) compounds having a molecular weight of at least 5000 and at least two double bonds of a type selected from the group consisting of acrylic, allylic, and maleic double bonds;

(B) compounds having a molecular weight of at least 400 but less than 5000 and at least one double bond of a type selected from the group consisting of acrylic, allylic and maleic double bonds; and

(C) compounds having a molecular weight of less than 400 and at least one double bond selected from the group consisting of acrylic, allylic, maleic and styrenic double bonds.

4,511,630

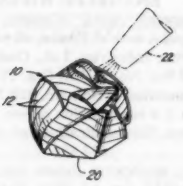
METHOD FOR SCULPTING PAPERWEIGHT OF ATTRACTIVE APPEARANCE

Tibor Kalman, 157 W. 57 St., New York, N.Y. 10019

Filed Feb. 17, 1984, Ser. No. 581,053

Int. Cl.³ B44C *3/06*

U.S. Cl. 428—542.2 **9 Claims**



1. A method for forming a sculpted paperweight having the appearance of crumpled paper, the method comprising the steps of

selecting a metal weight having a flat bottom,

selecting a rigid vinyl sheet of material,

printing desired patterns on said vinyl sheet,

heating said vinyl sheet until it is soft and wrapping said vinyl sheet in said soft and pliable condition around said metal weight to enclose said metal weight and conform the vinyl sheet to the flat bottom of the metal weight,

manually sculpting the soft pliable vinyl sheet to a desired apperance, and

cooling said soft pliable vinyl in its desired appearance to form a rigid sculpted paperweight.

4,511,631

METALLIC CHROMIUM-NICKEL-HYDRATED CHROMIUM OXIDE-COATED TIN FREE STEEL AND PROCESS FOR THE PRODUCTION THEREOF

Terunori Fujimoto; Nobuyoshi Shimizu; Mutsuhiro Shimizu; Kazunori Yanagihara; Akio Miyachi, and Tsuneo Inui, all of Yamaguchi, Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 599,822

Int. Cl.³ C25D *5/12, 5/48, 11/38*

U.S. Cl. 428—632 **21 Claims**

1. A tin-free steel having three layers consisting of a bottom layer of metallic chromium, a middle layer of metallic nickel and a top layer of hydrated chromium oxide on a steel base.

4. A process for continuously preparing a tin free steel having three layers consisting of a bottom layer of metallic chromium, a middle layer of metallic nickel and a top layer of hydrated chromium oxide on a steel base which comprises:

(a) chromium plating a steel base to form a layer of metallic chromium and hydrated chromium oxide thereon;

(b) a nickel plating the chromium plated steel base with a nickel plating solution under conditions sufficiently acidic to substantially dissolve said hydrated chromium oxide in said solution; and

(c) forming a layer of hydrated chromium oxide on the nickel plated, chromium plated steel base of step (b).

8. A process for continuously preparing a tin free steel having three layers consisting of a bottom layer of metallic chromium, a middle layer of metallic nickel and a top layer of hydrated chromium oxide on a steel base which comprises:

(a) chromium plating onto a steel base to form a layer of metallic chromium and hydrated chromium oxide thereon;

(b) removing the hydrated chromium oxide formed on the

chromium plated steel base by a cathodic treatment in an acidic solution;

(c) nickel plating the chromium plated steel base; and

(d) forming a layer of hydrated chromium oxide on the nickel plated chromium plated steel base of step (c).

4,511,632

ALUMINUM ALLOY CLAD SHEET HAVING EXCELLENT HIGH-TEMPERATURE SAGGING RESISTANCE AND THERMAL CONDUCTIVITY

Ken Toma, Susono; Masanao Iida, Numazu, and Yo Takeuchi, Susono, all of Japan, assignors to Mitsubishi Aluminum Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1982, Ser. No. 399,737

Int. Cl.³ B32B *15/20*

U.S. Cl. 428—654 **8 Claims**

1. A clad sheet comprising (i) an aluminum alloy sheet having excellent high-temperature sagging resistance and thermal conductivity and (ii) at least one brazing metal film clad on at least one surface of said aluminum alloy sheet;

said aluminum alloy sheet consisting essentially of:

manganese: from 0.1 to 0.5 wt.%,

silicon: from 0.1 to 0.8 wt.%,

zirconium: from 0.02 to 0.2 wt.%,

and, the balance being aluminum and incidental impurities;

said aluminum alloy clad sheet being particularly adapted to be used as a fin material for tubes of a heat exchanger.

4,511,633

GALVANIZED STEEL SHEET PROTECTED BY CHROMIUM AND CHROMIUM OXIDE LAYERS

Roberto Bruno, and Massimo Memmi, both of Rome, Italy, assignors to Zincroksid S.p.A., Turin, Italy

Filed Feb. 10, 1984, Ser. No. 579,079

Claims priority, application Italy, Mar. 21, 1983, 47949 A/83

Int. Cl.³ C25D *3/04*

U.S. Cl. 428—666 **6 Claims**

1. Steel sheet, protected by a zinc coating overlaid with a protective layer of chromium and hydrated oxides of chromium, the chromium metal being in the form of particles having average dimensions of about 0.03 micron, while at least 40% by volume of the metallic chromium is in the form of particles measuring less than 0.02 micron.

4,511,634

SOLDERABLE LAYER SYSTEM

Friedrich W. Nickol, Eppstein, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 3, 1982, Ser. No. 354,467

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110978

Int. Cl.³ H01L *23/48, 29/46, 1/14*

U.S. Cl. 428—686 **3 Claims**

1. A layer arrangement in an intermediate stage of manufacture of a transparent display prior to an oxidation process comprising

a corrosion-resistant solderable layer system connected at least indirectly to an oxidizable conductive layer,

a support on which the layer system and the conductive layer are applied,

said layer system (in said intermediate stage of manufacture prior to said oxidation process) comprises a solderable layer comprising a metal selected from the group consisting of iron and copper, and including adjacent at least a free surface of said solderable layer oxidizable means for forming upon the subsequent oxidation process by oxidation of said means only adjacent said free surface of the solderable layer a corrosion-protection layer covering and protecting said solderable layer at least adjacent said conductive layer from oxidation,

said solderable layer including said means comprising a portion of oxidizable metal other than iron and copper, and

said portion of said oxidizable metal comprising at least one metal selected from the group consisting of aluminum, chromium, indium, titanium and tin.

4,511,635

MAGNETIC RECORDING MEDIUM

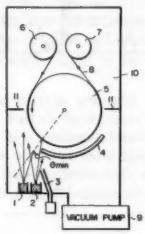
Makoto Nagao, and Akira Nahara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1983, Ser. No. 537,620

Claims priority, application Japan, Sep. 30, 1982, 57-171675

Int. Cl.³ G11B *5/65, 5/66*

U.S. Cl. 428—694 **11 Claims**



1. A magnetic recording medium comprising a non-magnetic high-molecular film and at least one magnetic layer containing Co, Ni, Cr and oxygen and formed on said non-magnetic high-molecular film by an oblique incidence vacuum deposition method, wherein the content of said Cr is within the range of 2 to 8 atom %, the content of said oxygen is within the range of 5 to 25 atom %, and the ratio of the number of oxygen atoms to the number of Cr atoms is within the range of 2:1 to 10:1.

4,511,636

MOLTEN CARBONATE FUEL CELL MATRICES

Wolfgang M. Vogel, Glastonbury, and Stanley W. Smith, Vernon, both of Conn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 7, 1983, Ser. No. 549,380

Int. Cl.³ H01M *4/86*

U.S. Cl. 429—41 **14 Claims**

1. A molten carbonate fuel cell comprising: an anode electrode; a cathode electrode; and a matrix containing an electrolyte which is molten during operation of the fuel cell, the two electrodes being separated by the electrolyte contained within the matrix, the cathode electrode including electrically non-insulating lanthanum containing material and the matrix including an electrically insulating lanthanum oxygenate.

4,511,637

BATTERY LATCH

Robert E. Evans, Piney Flats, Tenn., assignor to S & S Corporation, Cedar Bluff, Va.

Filed Oct. 6, 1983, Ser. No. 539,698

Int. Cl.³ H07M *2/10*

U.S. Cl. 429—100 **6 Claims**

1. A battery retaining mechanism for a battery powered vehicle comprising:

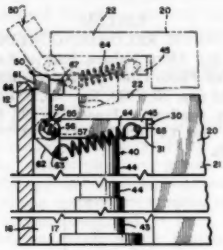
a receiving section on the battery powered vehicle adapted to receive a battery case;

a lifting mechanism comprising a hydraulic cylinder adapted to engage a battery case;

a retaining arm having a first end movable to a first and second position;

a means for biasing the retaining arm to the first position;

said arm positioned on the lifting mechanism so that upon movement into the receiving section contact with the receiving section moves said arm from the first position to the second position; and



said arm having a retaining section adapted to engage a battery case and positioned so that when said retaining arm is in the second position said retaining section is positioned to engage a battery case and when said retaining arm is in the first position said retaining section is positioned to be disengaged from a battery case.

4,511,638

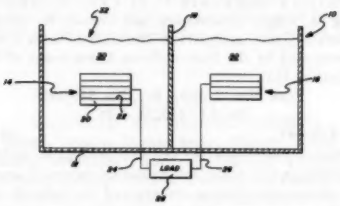
PHOTORESPONSIVE AMORPHOUS SEMICONDUCTOR MATERIALS, METHODS OF MAKING THE SAME, AND PHOTOANODES MADE THEREWITH

Krishna Sapru, Troy; Benjamin Reichman, Birmingham, and Gao Liang, Detroit, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jun. 1, 1983, Ser. No. 499,900

Int. Cl.³ H01M *6/36*; C25B *11/10*

U.S. Cl. 429—111 **42 Claims**



30. A photoelectrochemical cell for the conversion of light into electrical energy or energy stored in a fuel comprising:

a cell having an interior space therein, said space divided by a membrane positioned in said space to form an anode compartment and a counter electrode compartment within said cell,

an electrolyte in said anode compartment and in said counter electrode compartment;

a counter electrode positioned in said counter electrode compartment with at least a portion in contact with said electrolyte;

a photoanode positioned in said anode compartment with at least a portion in contact with said electrolyte;

said photoanode including a substrate having a deposition surface, and an amorphous semiconductor film in electrical contact with said deposition surface, said semiconductor film including a compensating agent selected from the group consisting of hydrogen, lithium, fluorine, beryllium, aluminum, boron, magnesium, other Group I elements, and compounds of these elements, said semiconductor film being cathodically treated to enhance its photoresponse; and

means for allowing light to enter the cell and illuminate said photoelectrode wherein the light will be converted into energy usable as electricity or a fuel.

4,511,639

METHOD FOR REGENERATING THE CARRIER PARTICLES OF A TWO-COMPONENT DEVELOPER CONSISTING OF CARRIER PARTICLES AND TONER

Joseph Knott, Tutzing, and Walter Kopp, Taufkirchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 5, 1982, Ser. No. 365,454

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115294

Int. Cl.³ G03G *9/10*

U.S. Cl. 430—108 **2 Claims**

1. A method for regenerating a developer particulate mix comprising carrier and toner particles contained in a developer unit arranged to deposit toner particles on an image bearing member comprising:

conducting a portion of a main body of said mix in said developer unit to a regenerator device,

removing toner crust formations from carrier particles in said regenerator device by impacting with an ultrasonic wave transmitter said mix portion carrier and toner particles with each other and walls of said regenerator device, and

returning said mix portion from said regenerator device to said main body in said developer unit.

4,511,640

AQUEOUS DEVELOPABLE DIAZO LITHOGRAPHIC PRINTING PLATES WITH ADMIXTURE OF POLYVINYL ACETATE AND STYRENE MALEIC ACID ESTER COPOLYMER

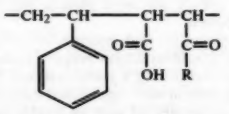
Shuchen Liu, Clinton, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Aug. 25, 1983, Ser. No. 525,927

Int. Cl.³ G03C *1/60*; G03F *7/08*

U.S. Cl. 430—157 **18 Claims**

1. An aqueous developable photosensitive lithographic printing plate composition which comprises, in admixture, about 20% to about 50% by weight of a light sensitive, negative working diazonium salt; about 8% to about 33% by weight of a polyvinyl acetate resin having an average molecular weight in the range of from about 100,000 to less than about 800,000; and about 25% to about 55% by weight of a styrene end-capped, styrene/maleic acid half ester co-polymer of the formula



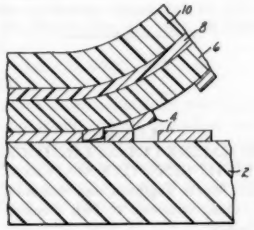
wherein R is a lower aliphatic alcohol residue having from 1 to about 5 carbon atoms and wherein said polymer has an average molecular weight of not more than about 50,000.

13. A lithographic printing plate which comprises a substrate and the composition of claim 1 coated on said substrate.

4,511,641
METAL FILM IMAGING STRUCTURE

Stanley C. Busman, Oakdale, and John C. Chang, New Brighton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 2, 1983, Ser. No. 463,295
Int. Cl.[3] G03C *1/60, 1/90;* G03F *7/26*
U.S. Cl. 430—158 20 Claims



1. A photosensitive, imageable article comprising:
(a) a substrate,
(b) a frangible, thin, light-opaque layer strippably adhered to said substrate, and
(c) a photosensitive layer comprising in admixture a film forming polymeric binder, between 0.2 and 10% by weight of the dry photosensitive layer of at least one acid-sensitive surfactant, and between 0.5 and 10% by weight of the dry photosensitive layer of at least one photochemical acid generator which alters the surface activity of the acid-sensitive surfactant when the photochemical acid generator is photoactivated, and said photosensitive layer is strippably adhered to said light-opaque layer

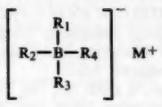
wherein the peel strength of the unexposed photosensitive layer to said light-opaque layer is less than or greater than the peel strength of said light-opaque layer to said substrate, and the peel strength of the photoactivated photosensitive layer to said light-opaque layer respectively becomes greater than or less than the peel strength of said light-opaque layer to said substrate.

4,511,642
PHOTO-FIXING HEAT-SENSITIVE RECORDING MEDIA WITH PHOTOSENSITIVE DIAZONIUM SALT, COUPLER, AND ORGANIC BORON SALT

Kensaku Higashi; Haruhiko Yano, both of Shizuoka; Hirotsugu Sato; Ken Sukegawa, both of Tokaimura, and Yuji Ooba, Yokosuka, all of Japan, assignors to Nippon Telegraph and Telephone Public Corp. and Tomoegawa Paper Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Feb. 9, 1983, Ser. No. 465,084
Claims priority, application Japan, Feb. 17, 1982, 57-22893; Feb. 17, 1982, 57-22894; Apr. 16, 1982, 57-62478; Jun. 7, 1982, 57-96175
Int. Cl.[3] G03C *1/60;* G01D *15/10*
U.S. Cl. 430—161 2 Claims

1. Photo-fixing heat-sensitive recording media which comprises a substrate and a coating layer of a recording composition formed on said substrate, said recording composition comprising at least one photosensitive diazonium salt and at least one coupler, both insoluble or sparingly soluble in water, and an organic boron salt capable of rendering the diazonium salt insoluble or sparingly soluble in water and represented by the formula



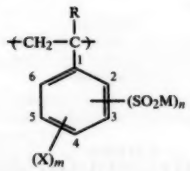
in which R_1–R_4 independently represent an alkyl group, an alkenyl group, a cycloalkyl group, an allyl group, an aryl group, a heterocyclic group or a cyano group, M^+ represents an alkali metal ion, at least one of the diazonium salt and the coupler being present in the form of a fine powder, said at least one diazonium salt, said at least one coupler and said organic boron salt being present in amounts sufficient for thermal recording of high sensitiveity with excellent storage stability even under high humidity conditions, said at least one diazonium salt, said at least one coupler and said organic boron salt being in admixture in a single layer or by reason of being in adjacent layers.

4,511,643
COLOR DIFFUSION TRANSFER PHOTOGRAPHIC ELEMENT

Ichizo Toya, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 22, 1983, Ser. No. 534,922
Claims priority, application Japan, Sep. 22, 1982, 57-165232
Int. Cl.[3] G03C *5/54, 1/40*
U.S. Cl. 430—212 20 Claims

1. A color diffusion transfer photographic element comprising at least
(a_1) a light-sensitive element comprising at least a mordant layer and a light-sensitive silver halide emulsion layer having associated therewith a dye image-providing material or
(a_2) a light-sensitive element comprising at least a light-sensitive silver halide emulsion layer having associated therewith a dye image-providing material and a dye image-receiving element comprising at least a mordant layer, and
(b) an alkaline processing composition element, which comprises a compound having recurrent units represented by the general formula (I):



(I)

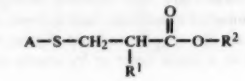
wherein:
R represents a hydrogen atom, an alkyl group, or a halogen atom;
M represents a hydrogen atom, an alkali metal atom, an alkaline earth metal atom or an organic base;
X represents an alkyl group, an alkoxy group, an alkylamino group or a halogen atom;
m is 0 or an integer of 1 or 2; and
n is an integer of 1 or 2.

4,511,644
PHOTOGRAPHIC ELEMENTS WITH DEVELOPMENT INHIBITOR PRECURSOR

Hisashi Okamura; Shinji Sakaguchi; Osamu Takahashi, and Ashita Murai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 9, 1983, Ser. No. 560,054
Claims priority, application Japan, Dec. 10, 1982, 57-216690
Int. Cl.³ G03C *5/54, 1/40, 1/34*
U.S. Cl. 430—219 **15 Claims**

1. A photographic element comprising a support having provided thereon at least one photosensitive silver halide emulsion layer, said photographic element containing a development inhibitor precursor represented by following general formula (I):



(I)

wherein A represents an unsubstituted or substituted phenyl group or a 5-membered or 6-membered nitrogen-containing heterocyclic ring; R^1 represents a hydrogen atom or a monovalent substituent; and R^2 represents an organic ballasting group.

4,511,645
PHOTOSENSITIVE PLATE FOR LITHOGRAPHIC PRINTING PLATE

Mitsuru Koike; Kesanao Kobayashi; Tadao Toyama; Hiroshi Misu, all of Shizuoka; Koji Tamoto, Kanagawa, and Masayuki Iwasaki, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 9, 1983, Ser. No. 530,821
Claims priority, application Japan, Sep. 9, 1982, 57-157198
Int. Cl.³ G03C *1/94, 1/68*
U.S. Cl. 430—276 **12 Claims**

1. A presensitized printing plate comprising:
a support base having positioned thereon
a photopolymerizable composition layer, the composition comprising:
(A) a copolymer of allylmethacrylate and methacrylic acid;
(B) a monomer or oligomer having at least two polymerizable ethylenically unsaturated double bonds; and
(C) a photopolymerization initiator.

3. A presensitizing printing plate, as claimed in claim 1, wherein the support base is comprised of a composite sheet comprising an aluminum sheet firmly attached to a polyethylene terephthalate film.

4,511,646
ETHYLENICALLY-UNSATURATED DEXTRIN COMPOSITION FOR PREPARING A DURABLE HYDROPHILIC PHOTOPOLYMER

Elsie A. Fohrenkamm, St. Paul, and Alan D. Rousseau, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 3, 1983, Ser. No. 471,828
Int. Cl.³ G03C *1/70;* **C08L** *3/02*
U.S. Cl. 430—283 **11 Claims**

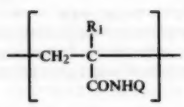
1. A photosensitive composition capable of providing a cross-linked hydrophilic photopolymer comprising
(a) an ethylenically unsaturated dextrin oligomer having a degree of substitution of about 0.20 to about 0.45,
(b) at least one hydroxyfunctional acrylamide monomer,
(c) inorganic solid particulate material, and
(d) a photoinitiation system, said composition, upon undergoing photopolymerization, forming a cross-linked hydrophilic photopolymer.

4,511,647
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Tsumoru Hirano; Morio Yagihara, and Makoto Umemoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

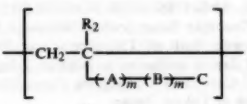
Filed Nov. 9, 1983, Ser. No. 549,947
Claims priority, application Japan, Nov. 9, 1982, 57-196575
Int. Cl.³ G03C *7/16, 7/26*
U.S. Cl. 430—381 **27 Claims**

27. A method of forming a color image comprising imagewise exposing a silver halide color photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer containing a cyan color image forming polymer coupler latex which comprises at least one recurring unit of a cyan coupler monomer capable of forming a dye upon coupling with an oxidation product of an aromatic primary amine developing agent represented by the general formula (I) described below, at least one recurring unit of an ethylenically unsaturated monomer containing an acid component represented by the general formula (II) described below and at least one recurring unit of methyl acrylate



(I)

wherein R_1 represents a hydrogen atom, a lower alkyl group containing from 1 to 4 carbon atoms or a chlorine atom; and Q represents a cyan coupler residue capable of forming a cyan dye upon coupling with an oxidized aromatic primary amine developing agent



(II)

wherein R_2 represents a hydrogen atom, a lower alkyl group containing from 1 to 4 carbon atoms or a chlorine atom; A represents —COO— or —CONH—; B represents an alkylene group containing from 1 to 10 carbon atoms which may be a straight chain, a branched chain or a cyclic, an aralkylene group containing from 7 to 18 carbon atoms or a phenylene group containing from 6 to 10 carbon atoms (inclusive of carbon atoms of substituents for the phenylene group); C represents —COOM or —SO_3M: M represents a hydrogen atom ion, an alkali metal ion, an alkaline earth metal ion or an ammonium ion; and m represents 0 or 1 deceloping the exposed material using an alkaline aqueous solution containing an aromatic primary amine developing agent.

4,511,648
LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Kiyoshi Yamashita, and Toshifumi Iijima, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

PCT No. PCT/JP82/00260, § 371 Date Feb. 24, 1983, § 102(e) Date Feb. 24, 1983, PCT Pub. No. WO83/00234, PCT Pub. Date Jan. 20, 1983

PCT Filed Jul. 10, 1982, Ser. No. 474,663

Claims priority, application Japan, Jul. 10, 1981, 56-106908; Dec. 11, 1981, 56-200477; Dec. 12, 1981, 56-200611; Dec. 13, 1981, 56-200552

Int. Cl.³ G03C *1/46, 1/08*

U.S. Cl. 430—503 **21 Claims**

1. A light-sensitive silver halide color photographic material comprising a support and at least two silver halide emulsion layers on the same side of said support, said at least two silver halide emulsion layers being sensitive to different spectral regions, at least one layer of said silver halide emulsion layers comprising at least two silver halide emulsion layers having different light-sensitivity, each of said at least two emulsion layers having different light-sensitivity,

containing at least one kind of substantially monodispersed silver halide crystals and at least one silver halide emulsion layer of said at least two emulsion layers having different light-sensitivity comprising a substantial amount of silver iodobromide containing at least 4 mole % of silver iodide, wherein the amount of iodine in the emulsion layer having the highest light-sensitivity is greater than the amount of iodine present in the emulsion layer having the second highest light-sensitivity.

4,511,649
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Akira Ogawa, and Momotoshi Tsuda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

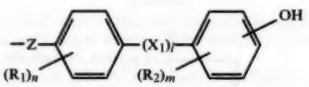
Filed May 21, 1984, Ser. No. 612,499

Claims priority, application Japan, May 20, 1983, 58-88940

Int. Cl.³ G03C *7/26, 7/32*

U.S. Cl. 430—553 **27 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer, the color photographic light-sensitive material containing a coupler having at the coupling position thereof a group represented by formula (I)



wherein Z represents an oxygen atom or a sulfur atom; R_1 and R_2 each represents a halogen atom, an alkyl group, an aryl group, an aralkyl group, an alkoxy group, an aryloxy group, a cyano group, a nitro group, a hydroxy group, a carboxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, an alkylsulfonamido group, an arylsulfonamido group, an alkylsulfamoyl group, an arylsulfamoyl group, an acylamino group, an amino group, an alkylcarbamoyl group, an arylcarbamoyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkylcarbonyl group or an arylcarbonyl group; X_1 represents a divalent organic connecting group; l is 0 or 1; and n and m each is 0, 1, 2, 3 or 4 and the total number of n+m is 1 to 8, and when n or m is 2 or more, the R_1 or R_2 groups may be the same or different.

4,511,650
HEAT DEVELOPABLE COLOR LIGHT-SENSITIVE MATERIALS WITH BASE RELEASORS

Hiroyuki Hirai, and Ken Kawata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 16, 1984, Ser. No. 590,396

Claims priority, application Japan, Mar. 16, 1983, 58-43860

Int. Cl.³ G03C *5/54, 1/40*

U.S. Cl. 430—559 **6 Claims**

1. A heat developable color light-sensitive material, comprising:

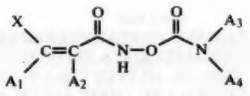
a support base having thereon;

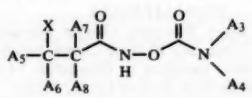
a light-sensitive silver halide;

a binder;

a dye-releasing material which is reductive to the light-sensitive silver halide and releases a hydrophilic dye by causing a reaction with the light-sensitive silver halide by heating; and

a base precursor represented by a general formula selected from the group consisting of the general formulae (A) and (B):





wherein A_1, A_2, A_5, A_6, A_7, and A_8 independently represent a substituent selected from a hydrogen atom, an alkyl group, a substituted alkyl group, a cycloalkyl group, an alkenyl group, an aralkyl group, an aryl group, a substituted aryl group, an acyl group, and a heterocyclic group, A_1 and A_2 may combine each other to form a ring, two of A_5, A_6, A_7 and A_8 may combine with each other to form a ring, and A_3 and A_4 each represents a hydrogen atom, an alkyl group, a substituted alkyl group, a cycloalkyl group, or an aralkyl group, A_3 and A_4 may combine with each other to form a ring and

may become a double bond to form an imino group and X represents a nucleophilic group.

4,511,651
REAGENT COMPOSITION AND ASSAY FOR THE DETERMINATION OF γ-GLUTAMYLTRANSFERASE ACTIVITY

Larry E. Beaty, Indianapolis, and Steven M. Lanham, Brownsburg, both of Ind., assignors to American Monitor Corporation, Indianapolis, Ind.

Filed Jul. 30, 1982, Ser. No. 403,680

Int. Cl.³ C12Q *1/48, 1/36;* C12N *9/96*

U.S. Cl. 435—15 **4 Claims**

1. A reagent composition for the determination of the enzyme γ-glutamyltransferase in a fluid, comprised of:

(a) an enzymatically reactive amount of γ-glutamyl-p-nitroanilide;

(b) a buffer;

(c) a glycylglycine; and

(d) a cyclodextrin from the group consisting of β-cyclodextrin and cyclodextrins substituted with 1 to 4 amino

groups in an amount between about 1 and 19 grams per liter.

4,511,652

HIGH EFFICIENCY EUKARYOTIC METALLOTHIONEIN PROMOTER SYSTEM

Seymour Fogel; Juliet W. Welch, both of Kensington, and Michael Karin, San Francisco, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 3, 1982, Ser. No. 384,821

Int. Cl.³ C12Q *1/29;* **C12P** *21/00, 21/02, 19/34;* **C12N** *15/00, 1/20, 1/16, 1/18, 1/00;* **C07H** *21/04*

U.S. Cl. 435—29 **18 Claims**

1. A DNA sequence encoding yeast copper chelatin or a copper chelating fragment thereof having naturally occurring flanking regions, each flanking region being less than 5 kbp.

4,511,653

PROCESS FOR THE INDUSTRIAL PREPARATION OF COLLAGENOUS MATERIALS FROM HUMAN PLACENTAL TISSUES, HUMAN COLLAGENOUS MATERIALS OBTAINED AND THEIR APPLICATION AS BIOMATERIALS

Dominique Play; Marc Bonneau; Charles Merieux; Daniel Herbage, all of Lyons, and Philippe Comte, Sainte-Foy-Les-Lyon, all of France, assignors to Foundation Merieux and Centre Technique du Cuir, both of Lyons, France

PCT No. PCT/FR82/00199, § 371 Date Oct. 14, 1983, § 102(e) Date Oct. 14, 1983

PCT Filed Nov. 25, 1982, Ser. No. 545,398

Claims priority, application France, Nov. 26, 1981, 81 22606

Int. Cl.³ C08H *1/06;* **C12P** *21/06*

U.S. Cl. 435—69 **5 Claims**

1. A process for the industrial preparation of human collagenous material from human placental tissue which comprises the steps of:

(a) pressing, grinding, and washing said placental tissue in a neutral or acid medium;

(b) subjecting the placental tissue treated according to step (a) to an alkaline treatment with a 0.5M NaOH, a 0.5M KOH, or a saturated lime water solution at a temperature less than or equal to 10° C.;

(c) centrifuging the placental tissue treated according to step (b) to form a first alkaline extract containing 10 to 20% by weight of the collagen in the placental tissue and to form a first insoluble residue which is equivalent to only 20% by weight of the placental tissue but which contains over 80% of the collagen in the placental tissue;

(d) removing the first alkaline extract from the first insoluble residue;

(e) treating the first insoluble residue formed during step (c) with a 0.1 to 0.5M NaOH solution at a temperature less than 10° C.;

(f) centrifuging the insoluble residue treated according to step (e) to form a second alkaline extract which contains about 16% of the collagen in the placental tissue;

(g) removing the second alkali extract from the first insoluble residue; and

(h) extracting the first insoluble residue subsequent to step (g) with a 0.1 to 0.5M acetic acid solution at a temperature less than 10° C. to form a second insoluble residue having a collagen content of about 85% and corresponding to about 68% by weight of the collagen in the placental tissue and an acid extract containing about 5% by weight of the collagen in the placental tissue, and removing the acid extract.

4,511,654

PRODUCTION OF HIGH SUGAR SYRUPS

Ronald P. Rohrbach, Forest Lake, Ill.; Mary J. Maliarik, Ann Arbor, Mich., and Thomas P. Malloy, Lake Zurich, Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 360,120, Mar. 19, 1982, abandoned. This application May 31, 1983, Ser. No. 499,652

Int. Cl.³ C12P *19/22, 19/20;* **C12N** *11/14*

U.S. Cl. 435—95 **9 Claims**

1. A process for the production of a high glucose or maltose syrup which comprises treating a feedstock having a low dextrose equivalent in the range of from about 5 to about 25 with an immobilized enzyme selected from the group consisting of amyloglucosidase and beta-amylase attached to an inorganic porous support material in a conversion zone at conversion conditions comprising a temperature in the range of from about 45° to about 70° C., a pressure in the range of from about 1 to about 1000 psi, a Liquid Hourly Space Velocity in the range of from about 2 to about 50 and a residence time in a range of from about 4 minutes to about 1.6 hours to form a partially hydrolyzed reaction mixture by conversion of said feedstock to glucose or maltose in a range of from about 50% to about 85%, while substantially preventing the formation of reversion products which impart a disagreeable taste to said syrup, passing the resultant partially hydrolyzed reaction mixture through an ultrafiltration membrane to form a retentate and a permeate, recycling the retentate to said conversion zone, and recovering the permeate comprising said high glucose or maltose content syrup.

4,511,655

PROCESS FOR PRODUCING 4-CYCLOPENTENONES

Masayoshi Minai, Moriyama, and Tadashi Katsura, Osaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

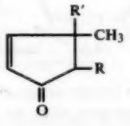
Filed Nov. 19, 1982, Ser. No. 443,017

Claims priority, application Japan, Nov. 19, 1981, 56-186658; Dec. 25, 1981, 56-212393; Mar. 15, 1982, 57-41207

Int. Cl.³ C12P *7/38, 7/62;* **C07B** *19/02*

U.S. Cl. 435—149 **11 Claims**

1. A process for producing 4-cyclopentenones of the formula:



wherein R is a lower alkyl group, a lower alkenyl group or a lower alkynyl group and R' is a hydroxyl group or an aliphatic acyloxy group, provided that the substituent R at the 2-position and the methyl group at the 3-position take a cis-configuration in the d- or l-form, which comprises hydrolyzing the corresponding 4-cyclopentenone wherein R' is an aliphatic acyloxy group in the dl-form with a microorganism or enzyme having a capability of selective hydrolysis of the d- or l-form in said starting corresponding 4-cyclopentenone in the dl-form to selectively obtain either the d- or l-form 4-cyclopentenone product.

4,511,656
DIRECT FERMENTATION OF D-XYLOSE TO ETHANOL BY A XYLOSE-FERMENTING YEAST MUTANT

Cheng-Shung Gong, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 263,925, May 15, 1981, Pat. No. 4,368,268. This application May 11, 1982, Ser. No. 376,731
The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.
Int. Cl.³ C12P *7/06*
U.S. Cl. 435—161 **23 Claims**

1. A process for the direct fermentation of D-xylose to ethanol which comprises inoculating a medium comprising growth nurients and D-xylose with a yeast mutant having an ability to ferment D-xylose to ethanol with a bioconversion yield of at least 50%, permitting the inoculated medium to ferment for a period of time sufficient to achieve a conversion of D-xylose to ethanol of at least 50% and recovering the ethanol so produced as product, said mutant being obtained from a parent yeast strain selected from the group consisting of Candida sp. and *Saccharomyces cerevisiae.*

4,511,657
TREATMENT OF OBNOXIOUS CHEMICAL WASTES

Joseph F. Colaruotolo, Grand Island, N.Y.; Robert L. Irvine, Mishawaka; Lloyd H. Ketchum, Jr., South Bend, both of Ind., and Wei-chi Ying, Grand Island, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed May 25, 1982, Ser. No. 381,866
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.³ C12N *1/22, 1/36;* **C12R** *1/38;* **C12K** *1/02*
U.S. Cl. 435—253 **16 Claims**

1. A microbial culture system comprising activated sludge and a supplemental microbial inoculant selected from the group consisting of ATCC 31945, ATCC 31941, ATCC 31942, ATCC 31940, ATCC **31943**, ATCC 31944, ATCC 31939, and mutants thereof, which is acclimated to metabolize chemical wastewaters and chemical waste landfill leachates, containing halogenated organic compounds.

4,511,658
COLORIMETRIC DETECTOR FOR FORMALDEHYDE VAPOR

Jack L. Lambert, Manhattan, and Yuan C. Chiang, Salina, both of Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Filed Feb. 28, 1983, Ser. No. 470,510
Int. Cl.³ G01N *21/78*
U.S. Cl. 436—130 **8 Claims**

1. The process of preparing a colorimetric detector for formaldehyde vapor, comprising:

(a) coating an inert solid support with a solid phase layer of stable metal bicarbonate;

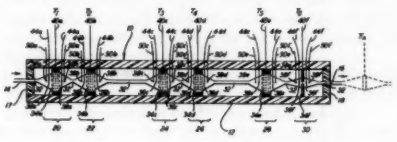
(b) applying to said metal bicarbonate layer a solution of 4-amino-3-hydrazino-5-mercapto-1,2,4-triazole (AHMT) in a volatile liquid ketone forming a compound with AHMT from which the ketone can be displaced by formaldehyde; and

(c) evaporating unreacted ketone from said layer and support to obtain a colorimetric detector sensitive to formaldehyde vapor in the detective range below 2 ppm formaldehyde.

4,511,659
LIQUID CHROMATOGRAPH WITH ELECTROCHEMICAL DETECTOR AND METHOD

Wayne R. Matson, Ayer, Mass., assignor to ESA, Inc., Bedford, Mass.

Continuation-in-part of Ser. No. 472,387, Mar. 4, 1983, abandoned, and a continuation-in-part of Ser. No. 425,183, Sep. 28, 1982, , which is a continuation of Ser. No. 111,917, Jan. 4, 1980, Pat. No. 4,404,065. This application Feb. 17, 1984, Ser. No. 579,401
Int. Cl.³ G01N *27/52, 33/48*
U.S. Cl. 436—150 **26 Claims**



1. An electrochemical detection apparatus for electrochemically testing a sample containing reversible and irreversible electrochemically active materials in solution, said apparatus comprising:

at least three coulometric electrochemical flow cell, each of said cells having therein at least one working electrode, at least one counter electrode and at least one reference electrode, said plurality of electrochemical cells being arranged in series and defining collectively at least one flow channel for said sample solution;

means for connecting each said reference electrode to a reference potential;

means connecting each said counter electrode to a counter potential; and

means connecting each said working electrode to a working potential, at least two of said cells constituting gate cells, each of said gate cells having means for maintaining its working electrode at a different potential from the other, one of said gate cells being at a potential to oxidize electrochemcially active materials in said sample and another of said gate cells being at a potential to reduce electrochemically active materials in said sample

said remaining cell or cells having means for maintaining its working electrode at a potential to detect and coulometrically measure electrochemically reversible materials in said sample.

13. The method for analyzing complex mixtures of electrochemically active fluids containing electrochemically irreversible materials and trace quantities of electrochemically reversible materials comprising the steps of passing said electrochemically active fluids sequentially through a liquid chromatographic column for achieving time spaced separation of the materials eluting from the column and an electrochemical detection apparatus for electrochemically testing a sample containing reversible and irreversible electrochemically active materials in solution, the detection apparatus comprising at least three coulometric cells arranged in series, maintaining the coulometric electrodes of two of said cells at different potentials to change the oxidation state of electrochemically reversible and electrochemically irreversible materials and convert at least some of said materials to an electrochemically inactive state at the potential maintained on a following coulometric measuring electrode, providing at least one additional test cell following said two gate cells, and coulometrically measuring electrochemically reversible materials of interest in the eluant at a measuring electrode held at a potential adequate to detect and measure the quantity of said materials of interest.

4,511,660
PROCESS AND ARRANGEMENT FOR MEASURING ION STRENGTH

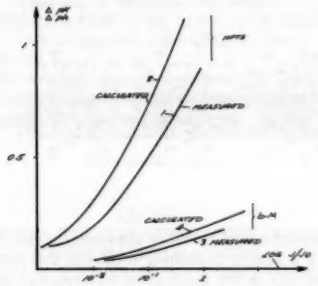
Dietrich W. Lübbers, Rheinlanddam 201a, D-4600 Dortmund, and Norbert Opitz, Marianstrasse 18, D-4630 Bochum, both of Fed. Rep. of Germany

Filed Jun. 10, 1983, Ser. No. 503,251

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1982, 3222325

Int. Cl.[3] **G01N** *21/00, 21/77, 27/36*

U.S. Cl. 436—163 **18 Claims**



1. Process for directly measuring the ion strength of an electrolyte solution comprising the combination of steps of:

measuring the pH value of the electrolyte solution with a first indicator;

measuring the pH of the electrolyte solution with a second indictator which is dependent on the ion strength in a manner different from said first indicator; and

computing the ion strength J of said solution from said first pH measurement and said second pH measurement according to:

$$J = Jo \cdot 10^{F(N)} \left[1 + \frac{W(X) + 0.5}{W(N) - W(X)} \right] [pH'(N) - pH'(X)]$$

wherein

Jo=ion strength upon calibration;

pH'(N)=pH value, measured with the first indicator;

pH'(X)=pH value, measured with the second indicator;

W(N)=valency of the first indicator

W(X)=valency of the second indicator; and

$$F(N) = -\frac{1}{0.07[2W(N) + 1]}.$$

4,511,661
ATCC HB8116 AND ITS MONOCLONAL ANTI-H-Y ANTIBODY, HYCLONALAN

Ellen H. Goldberg, Albuquerque, N. Mex., assignor to University Patents, Inc., Norwalk, Conn.

Continuation-in-part of Ser. No. 359,707, Mar. 19, 1982, abandoned. This application Dec. 30, 1983, Ser. No. 567,395

Int. Cl.[3] **G01N** *33/54, 33/58;* **C12N** *15/00*

U.S. Cl. 436—503 **12 Claims**

2. A monoclonal antibody, Hyclonalan, produced by hybridoma cell line ATCC HB8116 and having selective binding affinity to H-Y antigen.

3. An immunological procedure for the identification and separation of male mammalian cells from female mammalian cells comprising:

(a) contacting a mixture of said male and female cells with the monoclonal antibody, Hyclonalan, that has specific binding affinity to H-Y antigen and is produced by hybridoma cell line ATCC HB8116;

(b) allowing a selective immunological reaction to occur between said male cells and Hyclonalan resulting in an antibody-male cell complex; and

(c) detecting said complex and separating said female cells from said complex.

4,511,662
SIMULTANEOUS ASSAY FOR T AND B LYMPHOCYTE POPULATIONS AND SUBPOPULATIONS

Madelyn M. Baran, Novato, and Dennis M. Bleile, Emeryville, both of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Jun. 18, 1982, Ser. No. 389,838

Int. Cl.[3] **G01N** *33/54*

U.S. Cl. 436—513 **26 Claims**

1. A method for simultaneously determining the relative number of B cells and T cells in a lymphocyte population of a vertebrate, said method employing (1) B cell labels comprising insoluble polymeric particles having a size in the range from 5 to 15 microns bound to B cell binding proteins and (2) T cell labels comprising insoluble polymeric particles having a size in the range from 5 to 15 microns bound to T cell binding protein, at least one of said B cell and T cell labels being covalently coupled to a dye which imparts a color to the particle which is visible under a light microscope, said method comprising:

incubating the lymphocyte population simultaneously with the B cell labels and T cell labels for a time sufficient for all of the B cells and T cells to specifically form rosettes with the corresponding label; and

counting the number of B cell rosettes and T cell rosettes under a light microscope.

4,511,663
FIBER-REINFORCED COMPOSITES

Mark P. Taylor, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 9, 1984, Ser. No. 638,781

Int. Cl.[3] **B32B** *9/00;* **D02G** *3/00*

U.S. Cl. 501—4 **6 Claims**

1. A fiber-reinforced composite having an improved mechanical strength and being composed of metal-coated, carbon fibers embodied within a glass or glass-ceramic matrix.

4,511,664
PROCESS FOR MANUFACTURING CERAMIC FIBERS CONSISTING MAINLY OF ALUMINA AND SILICA

Masafumi Yamamoto, Toyokawa, Japan, assignor to Isolite Babcock Refractories Co., Ltd., Aichi, Japan

Filed Jun. 4, 1984, Ser. No. 617,192

Claims priority, application Japan, Oct. 4, 1983, 58-186578

Int. Cl.[3] **C03C** *13/00*

U.S. Cl. 501—35 **8 Claims**

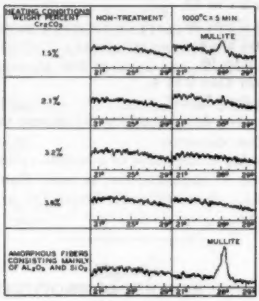
5. A ceramic fiber product consisting mainly of alumina and silica, which is produced by a method comprising:

melting a material containing 35 to 65% by weight of Al_2O_3, 30 to 60% by weight of SiO_2, 1.5 to 4% by weight of Cr_2O_3 and 0.01 to 0.1% by weight of carbon;

forming amorphous fibers from said molten material;

heating said amorphous fibers rapidly to a temperature of 950° C. to 1,150° C.;

holding the heated fibers at said temperature for several to about a dozen minutes; and



cooling the heated fibers rapidly to ordinary room temperature.

4,511,665

DECORATIVE HARD GOLDEN CERAMIC ARTICLE

Yoshio Nagato, Kokubu, and Kazunori Soroi, Sendai, both of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Sep. 26, 1983, Ser. No. 535,739
Claims priority, application Japan, Sep. 30, 1982, 57-173769
Int. Cl.³ C04B *35/10, 35/48, 35/58*
U.S. Cl. 501—96 **8 Claims**

1. A decorative hard golden ceramic article consisting essentially of at least one member selected from titanium nitride and zirconium nitride as the main component, and 0.1 to 5% by weight of at least one member selected from alumina (Al_2O_3) and zirconia (ZrO_2).

4,511,666

PROCESS FOR PRODUCING BETA'-SILICON ALUMINUM OXYNITRIDE (B'-SIALON)

Frankie E. Phelps, Lower Burrell; Paul J. Boget, and Robert L. Troup, both of Murrysville, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 16, 1982, Ser. No. 450,337
Int. Cl.³ C04F *35/56*
U.S. Cl. 501—98 **10 Claims**

1. A process for producing an essentially beta'-SiAlON refractory material, the process comprising:

providing a uniform mixture of initial reactant materials as sources of SiO_2, Al_2O_3 and C in a reactor;

nitriding said mixture at temperatures between 1200° C. and 1450° C. for a time sufficient to convert at least a portion of said initial reactants to at least a portion of effective reactants; and

heating said effective reactants in the presence of nitrogen at temperatures from 1400° to 1650° C. for a time sufficient to convert said effective reactants to an essentially beta'-SiAlON refractory material.

4,511,667

COMPOSITE ZEOLITE-ASBESTOS CATALYSTS

Raymond L. V. Mao, 2725 Place Darlington, Apt. 1, Montreal, Quebec H3S 1L4, Canada, and Peter H. Bird, 4166 Hingston Ave., Montreal, Quebec H4A 2J7, Canada

Filed Jan. 16, 1984, Ser. No. 571,348
Claims priority, application Canada, Apr. 26, 1983, 426687
Int. Cl.³ B01J *29/08, 29/28, 21/16*
U.S. Cl. 502—64 **29 Claims**

1. A composite crude zeolite-asbestos-zeolite promoter material having a microstructure having intermingled crude zeolite and asbestos formations together with a zeolite-promoter substance.

16. A method of making a composite zeolite-asbestos-zeolite promoter material having intimately intermingled zeolite and asbestos formations together with a zeolite-promoter substance which comprises:

(a) leaching asbestos with acid solution until part of the metal components of the asbestos lattice is solubilized;

(b) impregnating the dried solid from (a) with a mixture of zeolite promoter substance and alkali metal hydroxide in aqueous solution, incubating at an elevated temperature sufficient to favor the formation of complex silicates and adding a solution of an aluminate of an alkali metal and continuing to incubate at an elevated temperature to obtain a geliform suspension, adding further zeolite promoter substance, the quantities and properties of materials added being sufficient to ensure the production of zeolite in subsequent treatment; and

(c) heating the resulting incubated mixture sufficiently to yield crude zeolite formations in situ and yield the composite zeolite-asbestos-zeolite promoter material.

20. The method of claim 16 in which the zeolite promoter substance is a zeolite-structure-forming substance and the zeolite formations resulting from step (c) are ZSM-5.

4,511,668

CATALYST FOR USE IN HYDROLYSIS OF CARBONYL SULFIDE

Ikutoshi Nozue; Susumu Fujii, and Masayuki Hanada, all of Kitakyushu, Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1983, Ser. No. 545,406
Int. Cl.³ B01J *21/06, 23/02, 23/06, 23/14*
U.S. Cl. 502—84 **6 Claims**

1. A catalyst composition for use in the hydrolysis of carbonyl sulfide to convert same into hydrogen sulfide, which consists essentially of a catalyst carrier made of titanium oxide and not more than 30 wt.% of a reinforcing material selected from the group consisting of silica, alumina, clay and aluminosilicate, said catalyst carrier having deposited thereon from 0.5 to about 10 wt.% of at least one oxide of a metal of Group IA or Group IIA of the Periodic Chart of the Elements.

4,511,669

HIGH EFFICIENCY CATALYSTS FOR VARYING OLEFIN POLYMER MOLECULAR WEIGHT DISTRIBUTION

Donald E. Gessell, Ponca City, Okla., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 429,631, Sep. 30, 1982, abandoned. This application Aug. 18, 1983, Ser. No. 523,867
Int. Cl.³ C08F *4/02, 4/64, 4/68, 4/62*
U.S. Cl. 502—110 **30 Claims**

5. A method for the preparation of an olefin polymerization catalyst comprising combining

(1) the reaction product of a hydropolysiloxane of the general formula

$$[R^1{}_aH_bSiO_{4-\frac{(a+b)}{2}}]_n$$

wherein R^1 is selected from the group consisting of hydrogen, halogen, alkyl groups containing from 1 to 20 carbon atoms, aryl groups, aralkyl groups, alkaryl groups and acyloxy groups, each containing from 6 to 20 carbon atoms, a is from 0.1 to 2, b is greater than 0 and n is greater than 0, where the sum of a and b does not exceed 3, with a dialkyl magnesium or alkyl magnesium alkoxide of the general formula

RMgR or RMgOR

wherein each R is, independently, hydrogen, alkyl groups containing from 1 to 20 carbon atoms, aryl groups, aralkyl groups and alkaryl groups each containing from 6 to 20 carbon atoms, to form a reaction product having a Si-O/Mg molar ratio of at least 1.0, with

(2) non-halide transition metal alkoxides having at least one of the general formulas

$$RO\{M(OR)_2O\}_pR \text{ or } MO_q(OR)_r \text{ or } R_xM(OR)_y$$

where M is titanium, vanadium, chromium or zirconium and R is an alkyl group containing from 1 to 20 carbon atoms, aryl groups, aralkyl groups and alkoxyl groups each containing from 6 to 20 carbon atoms, q is 0 or 1, r is from 2 to 4, and $2q+r$ is equal to the valence of M; p is at least 2; and $x+y$ is equal to the valence of M, and

(3) a halogenating agent to obtain a polymerization catalyst having a halogen to magnesium ratio of at least 2.0.

4,511,670

CATALYSTS CONTAINING MIXED OXIDES OF VANADIUM, PHOSPHORUS, AND ALUMINUM AND/OR BORON

George D. Suciu, Ridgewood, N.J.; Giancarlo Stefani, and Carlo Fumagalli, both of Bergamo, Italy, assignors to The Lummus Company, Bloomfield, N.J.; Alusisse Italia S.p.A., Milan, Italy

Filed Aug. 17, 1983, Ser. No. 523,769

Int. Cl.³ B01J *27/14, 21/02;* C07D *307/60*

U.S. Cl. 502—209 **23 Claims**

1. A composition of matter, comprising:

a mixed oxide catalyst comprising vanadium, phosphorus and a member selected from the group consisting of aluminum, boron and mixtures thereof, said catalyst having a phosphorus to vanadium atomic ratio, based on phosphorus uncombined with said member, of from 1:1 to 2:1, an atomic ratio of said member to vanadium of at least 0.10:1, said catalyst having been prepared by treating dried solid catalyst precursor comprising mixed oxides of vanadium and phosphorus in finely divided form with a solution of phosphoric acid and a member selected from the group consisting of water soluble compounds of aluminum, boron and mixtures thereof; and drying of the treated solid catalyst precursor to provide a solid catalyst.

4,511,671

CATALYST FOR MANUFACTURING METHACROLEIN

Noboru Saito, Takatsuki; Takeshi Satake, Kyoto; Ryuji Aoki, Himeji, and Isao Nagai, Suita, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Sep. 1, 1983, Ser. No. 528,560

Claims priority, application Japan, Sep. 6, 1982, 57-153819

Int. Cl.³ B01J *21/08, 23/78, 23/84, 23/88*

U.S. Cl. 502—242 **6 Claims**

1. A catalyst for manufacturing methacrolein by the vapor phase oxidation of isobutylene or tertiary butanol, said catalyst having the composition represented by the following formula

$$Mo_aW_bBi_cFe_dA_eB_fC_gD_hO_x$$

wherein

A represents at least one element selected from the group consisting of nickel and cobalt,

B represents at least one element selected from the group consisting of alkali metals, alkaline earth metals and thallium,

C represents at least one element selected from the group consisting of tellurium, antimony, tin, cerium, lead, manganese and zinc,

D represents at least one element selected from the group consisting of silicon, aluminum, zirconium and titanium,

a, b, c, d, e, f, g, h, and x respectively represent the atomic ratios of Mo, W, Bi, Fe, A, B, C, D, and O, and when

a is fixed at 12,

b is from 0 to 10,

c is from 0.1 to 10,

d is from 0.1 to 20,

e is from 2 to 20,

f is from 0 to 10,

g is greater than 0 to 4,

h is from 0 to 30 and

x is a number determined by the atomic valences of the individual elements,

and being molded in the shape of a hollow cylinder having an outside diameter of 3.0 to 10.0 mm, an inside diameter 0.1 to 0.7 times the outside diameter and a length 0.5 to 2.0 times the outside diameter.

4,511,672

CATALYST AND REVERSE DISPROPORTIONATION PROCESS

Charles F. Hobbs, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 403,255, Jul. 29, 1982, abandoned. This application Jan. 16, 1984, Ser. No. 571,291

Int. Cl.³ B01J *23/18, 23/02*

U.S. Cl. 502—243 **5 Claims**

1. A catalyst consisting essentially of catalytically-effective amounts of bismuth, tungsten and an alkali or alkaline earth component on a carrier material.

4,511,673

CATALYST FOR REFORMING OF METHANOL AND PROCESS OF PREPARING SAME

Yoshiyuki Eto, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 24, 1983, Ser. No. 478,350

Claims priority, application Japan, Apr. 2, 1982, 57-53712

Int. Cl.³ B01J *23/10, 23/40*

U.S. Cl. 502—525 **28 Claims**

1. A catalyst for reforming methanol to hydrogen and carbon monoxide, consisting essentially of:

a carrier which comprises active alumina over at least substantially the entire surface thereof; applied to said carrier, at least one compound oxide which is expressed by the general formula $MAlO_3$ which is a perovskite structure, wherein M represents a metal element selected from the group consisting of the titanium family elements; and at least one catalytic metal of the platinum group, deposited in reduced metallic form on said carrier.

4,511,674

PROCESS AND CATALYST FOR THE PREPARATION OF A GAS MIXTURE HAVING A HIGH CONTENT OF C_2-HYDROCARBONS

Karsten Pedersen, Birkerod; Jens R. Rostrup-Nielsen, Virum, and Ib Greve H. Jorgensen, Bloustrod, all of Denmark, assignors to Haldor Topsøe A/S, Lyngby, Denmark

Continuation-in-part of Ser. No. 215,546, Dec. 11, 1980, abandoned. This application Oct. 15, 1982, Ser. No. 434,493

Claims priority, application Denmark, Dec. 18, 1979, 5395/79

Int. Cl.³ C07C *1/04*

U.S. Cl. 518—714 **2 Claims**

1. In a process for the conversion of a synthesis gas mixture containing hydrogen and carbon oxides to a mixture of hydrocarbons by catalytic conversion, the improvement wherein said synthesis gas mixture contains at least 10 ppm of at least one gaseous sulfur compound calculated as H_2S and said conversion is conducted at a temperature of 270°–400° C. and at a pressure of 15–150 bar in the presence of a catalyst consisting of molybdenum sulfide and cobalt sulfide, said catalyst being supported on a porous oxidic support consisting essentially of titanium dioxide, whereby the predominant hydrocarbon com-

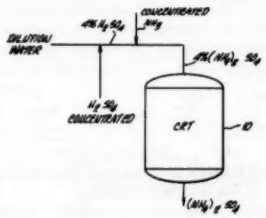
ponent contained in said product mixture of hydrocarbons is a C_2-hydrocarbon.

4,511,675

METHOD FOR REGENERATING WATER POLISHERS USING AMMONIUM SULPHATE

David C. Auerswald, 908 Firmona Ave., Redondo Beach, Calif. 90278

Filed Apr. 19, 1983, Ser. No. 486,380
Int. Cl.³ B01D *15/06*
U.S. Cl. 521—26 **17 Claims**



1. In a process for regenerating cation exchange resin and anion exchange resin used for polishing water, wherein regenerants are passed through a cation resin tank containing principally the cation exchange resin and some of the anion exchange resin and an anion resin tank containing principally the anion exchange resin and some of the cation exchange resin, the improvement comprising the step of passing an aqueous solution of ammonium sulfate through the cation resin tank to remove cations therefrom.

4,511,676

METHOD FOR CLEANING ORGANICALLY FOULED ANION EXCHANGE RESINS USING DIETHYLENE GLYCOL COMPOUND OR DERIVATIVE

David W. Reichgott, and Michael J. Leary, both of Richboro, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 8, 1983, Ser. No. 521,296
Int. Cl.³ C08D *5/20*
U.S. Cl. 521—26 **11 Claims**

1. In a method of removing organic foulants selected from the group consisting of humic acids, lignins, and tannins from an anionic exchange resin wherein said fouled resin is treated with a member or members selected from the group consisting of brine and caustic to aid in removal of said foulants, the improvement comprising also contacting said fouled resin with an aqueous composition comprising an effective diethylene glycol compound or derivative, said diethylene compound or derivative having the formula:

$$R—O—CH_2—CH_2O—CH_2—CH_2—O)_nR^1$$

wherein R and R^1 are independently selected from the group consisting of lower alkyl, acyl, and hydrogen, n=1 or 2.

4,511,677

ION EXCHANGE-ACTIVE COMPOSITIONS CONSISTING OF WATER-SOLUBLE POLYELECTROLYTE UPON ION EXCHANGE FUNCTIONAL SUBSTRATE

Robert L. Horton, South Russell, Ohio, and G. Allan Stahl, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 2, 1983, Ser. No. 548,051
Int. Cl.³ B01J *39/06;* **C01G** *56/00, 57/00*
U.S. Cl. 521—28 **5 Claims**

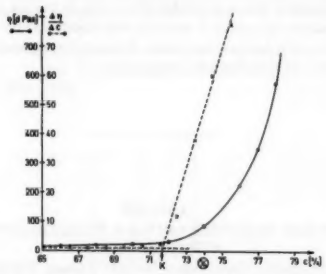
1. An ion exchange process comprising the use of an ion exchange compound comprising a water soluble polymer having multiple ionic functional groups and an ion exchange functional substrate which is at least one of a clay, uranium ore, zeolite, mineral, charcoal or carbon black.

4,511,678

RESILIENT FOAM BASED ON A MELAMINE-FORMALDEHYDE CONDENSATE

Harald Mahnke, Ludwigshafen; Frank P. Woerner, Wachenheim; Heinz Weber, Gruenstadt, and Guenter Kreibiehl, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 516,855, Jul. 25, 1983, which is a continuation of Ser. No. 366,566, Apr. 8, 1982, which is a continuation of Ser. No. 126,393, Apr. 8, 1982, abandoned, Ser. No. 400,050, Jul. 20, 1982, and Ser. No. 330,373, Dec. 14, 1981, which is a division of Ser. No. 242,561, Mar. 11, 1981, Pat. No. 4,334,971, said Ser. No. 400,050, is a continuation of Ser. No. 126,388, Mar. 3, 1980, abandoned. This application Sep. 9, 1983, Ser. No. 530,695
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1979, 2915457; Apr. 17, 1979, 2915467; Mar. 27, 1980, 3011769
Int. Cl.³ C08J *9/38*
U.S. Cl. 521—52 **19 Claims**



1. A process for the preparation of a resilient, reticulated foam based on a melamine/formaldehyde condensate which contains not less than 50% by weight of melamine and formaldehyde as condensed units, and from 0 to 50% by weight of other compounds selected from the group consisting of alkyl-substituted melamine, urea, urethanes, carboxylic acid amides, dicyandiamide, guanidine, sulfurylamide, sulfonic acid amides, aliphatic amines, phenol and phenol derivatives and containing amino, amide, hydroxyl or carboxyl groups and capable of forming thermosetting resins, and aldehydes selected from the group consisting of acetaldehyde, trimethylolacetaldehyde, acrolein, benzaldehyde, furfuraldehyde, glyoxal, phthaladehyde and terephthalaldehyde and which react therewith to form such resins, as co-condensed units, which resilient foam exhibits the following properties:

(a) the bulk density, measured according to DIN 53,420, is from 4 to 80 [$g.l^{-1}$];

(b) the heat conductivity measured according to DIN 52,612, is less than 0.06 [$W.m^{-1}.°K^{-1}$];

(c) the compressive strength, measured according to DIN 53,577 at 60% compression, divided by the bulk density, is less than 0.30 [$N.cm^{-2}/g.l^{-1}$], and in determining the compressive strength at 60% compression the foam must recover to not less than 90% of its original height;

(d) the modulus of elasticity, measured by methods similar to DIN 53,423, divided by the bulk density is less than 0.25 [$N.mm^{-2}/g.l^{-1}$];

(e) the deflection on break, measured according to DIN 53,423, is greater than 9 [mm]; and

(f) the foams are of not more than normal flammability when assessed according to DIN 4,102, which process comprises: forming an aqueous solution or dispersion, which

contains a melamine/formaldehyde precondensate, an emulsifier, a volatile blowing agent and a curing agent, with or without conventional additives, and then curing the foam, wherein

(a) the concentration of the precondensate in the mixture of precondensate and water (without additives) is selected to be above the salient point of the 1st derivative of the curve which is obtained when, keeping all other conditions constant, the amount of water in the mixture of precondensate and water is varied and the viscosity of the mixture (measured at the boiling point of the blowing agent under the conditions prevailing at the start of foaming) is plotted against the concentration of the precondensate, which concentration must however not be higher than the value which in the curve described corresponds to a viscosity of 5,000 dPas,

(b) during the forming process, up to the time at which the foam has reached 80% of the maximum attainable rise height, the visosity of the aqueous solution or dispersion must not fall below the value which, in the curve described under (a), corresponds to the minimum concentration defined there, but must not exceed 6,000 dPas, and

(c) after reaching the time defined under (b), the viscosity exceeds a value of 10,000 dPas, due to curing of the precondensate, within 8 minutes, the viscosities referred to in (b) and (c) measured, in each case, on a parallel system which is free from blowing agent.

4,511,679

PROCESS FOR PREPARING A RUBBER-ASPHALT COMPOSITION

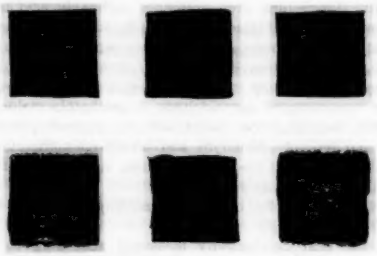
Takashi Ariyoshi, Kudamatsu; Noriaki Emura, Tokuyama, and Yasuhiro Sakanaka, Shin-nanyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,799

Claims priority, application Japan, Dec. 21, 1982, 57-222919

Int. Cl.³ C08J *9/10*

U.S. Cl. 521—83 **7 Claims**



1. A process for preparing a rubber-asphalt composition, which comprises blending a particulate or powdery rubber composition comprising 100 parts by weight of a particulate or powdery rubber having a particle size of at most 2 mm and from 0.1 to 50 parts by weight of a particulate or powdery blowing agent having a particle size of at most 1 mm, with asphalt composition containing from 0.1 to 30 parts by weight of an organic base from the group consisting of higher amines of primary amines, tertiary amines, polyamines and their derivatives and quanternary ammonium salts, based on 100 parts by weight of the asphalt, wherein the rubber composition is blended with the asphalt composition at a temperature of from 60° to 200° .

4,511,680

PROCESS FOR THE CONTINUOUS HIGH TEMPERATURE GLYCOLYTIC CLEAVAGE OF POLYURETHANE PLASTICS WASTE IN SCREW MACHINES

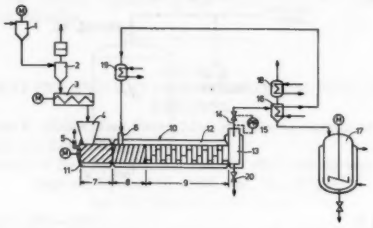
Georg Niederdellmann, Dormagen, and Ernst Grigat, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 525,846

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232461

Int. Cl.³ B29C *29/00*; C08J *11/00*; C08L *75/00*; B09B *3/00*

U.S. Cl. 521—49.5 **7 Claims**



1. A process for the continuous glycolytic cleavage of polyurethane plastics waste, by the addition of ambient temperature or pre-heated diols, the process being carried out at elevated temperature and under elevated pressure, characterized in that the plastics waste is introduced via a feed funnel into a multishaft screw machine together with diols in a weight ratio of from 10:1 to 1:1, the mixture of plastics waste and diols being maintained in the screw machine in a reaction zone with intensive material and heat exchange for from 2 to 30 minutes at a temperature of from 250° to 350° C., while maintaining a liquid diol phase in the degradation mixture by a pressure of up to 100 bars, the polyol-containing degradation mixture resulting from the glycolytic degradation issuing into a cooled pressure-relieving vessel and into a cooled receiver via a discharge outlet connected to the screw machine, while maintaining the liquefying pressure and a constant liquid level, and the temperature of the resulting degradation polyol mixture being reduced to below 200° C. in less than 30 minutes.

4,511,681

PROCESS FOR PRODUCING A POLYIMIDE SOLUTION

Masatoshi Yoshida, Oyama, and Yasuo Miyadera, Shimodate, both of Japan, assignors to Hitachi Chemical Company, Tokyo, Japan

Filed Apr. 27, 1983, Ser. No. 489,178

Claims priority, application Japan, Apr. 27, 1982, 57-70923

Int. Cl.³ C08G *73/10*; C08K *5/13*; C08L *79/08*

U.S. Cl. 523—310 **16 Claims**

1. A process for producing a homogeneous polyimide solution which comprises effecting polymerization and imidization concurrently at a reaction temperature of 100° to 200° C. in the presence of a halogenated phenolic compound as a solvent by reacting a tetracarboxylic acid component and an aromatic diamine component while initially removing water formed by condensation until the reduced viscosity of the polyimide in the reaction solution becomes 0.1 or higher and successively continuing the reaction under atmospheric pressure and reflux of water until the rotation viscosity of the reaction solution becomes constant; the tetracarboxylic acid component comprising at least 50 mole % of 3,3',4,4'-benzophenonetetracarboxylic acid or an anhydride or an ester thereof and 50 mole % or less of pyromellitic acid or an anhydride or an ester thereof and the aromatic diamine component comprising at least 75 mole % of 4,4'-diamino-diphenyl ether and 25 mole % or less of p-phenylenediamine, both the tetracarboxylic acid component and the aromatic diamine component being used in ap-

proximately equimolar amounts in a concentration that provides a transparent and homogeneous polyimide solution from which a polyimide film can be formed and the polymerization and the imidization being conducted until the degree of imidazation of said polyimide is 90% or more.

3. A process according to claim 1, wherein the reaction is initially effected in the presence of a zeolite which is in a dry condition when added to the reaction solution.

4. A process according to claim 1, wherein further dehydration is conducted after polymerization and imidization.

5. A process according to claim 4, wherein the further dehydration is conducted by using zeolite.

11. A process according to claim 1, wherein the halogenated phenolic compound is p-chlorophenol, m-chlorophenol, p-bromophenol, m-bromophenol, 2,4-dichlorophenol, 2,4,6-trichlorophenol, 2,4-dibromophenol, 2,4,6-tribromophenol or a mixture thereof.

4,511,682
WATER-DISPERSIBLE COATING COMPOSITIONS AND PROCESS

Walter P. Mayer, Lebanon, and Richard J. Burns, Piscataway, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 508,671, Jun. 28, 1983, abandoned. This application May 29, 1984, Ser. No. 614,799

Int. Cl.[3] **C09D** *3/52, 3/49, 3/54, 3/58*

U.S. Cl. 523—402 **51 Claims**

1. A process for preparing water-dispersible, block copolymer coating compositions, which process comprises:

(1) forming a reaction mixture comprising (i) a water-indispersible, film-forming, organic polymer having an average of at least three hydroxyl groups per molecule (hereinafter referred to as "Reactant A"), (ii) an organic polymer, other than an ethylene-maleic anhydride copolymer, which has an average of at least two carboxylic acid anhydride groups per molecule and which, after hydrolysis and neutralization of at least some of the anhydride groups with a base, is dispersible in water, (hereinafter referred to as "Reactant B"), and (iii) an esterification catalyst;

(2) reacting hydroxyl groups of Reactant A and anhydride groups of Reactant B to form ester groups and carboxy groups, such reaction being conducted to the extent necessary to produce a film-forming composition which, after neutralization of at least some of the carboxy groups with a base, is dispersible in a primarily aqueous medium having a pH over 5; and

(3) controlling said reaction to prevent gelation of the composition by incorporating in said reaction mixture water or a low molecular weight organic compound containing one or two groups reactive with said anhydride groups.

4,511,683
SULFONIC ACID COMPOUND HAVING CYCLOPENTADIENE SKELETON AND COMPOSITION COMPRISING SAME AND CEMENT

Hironobu Shinohara; Noboru Yamahara, and Yoshinori Yoshida, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

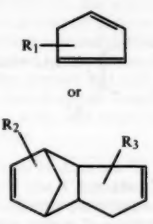
Filed Mar. 3, 1983, Ser. No. 471,671

Claims priority, application Japan, Mar. 8, 1982, 57-35147; Mar. 8, 1982, 57-35148; Mar. 8, 1982, 57-35149; Mar. 9, 1982, 57-35731; Mar. 9, 1982, 57-35732; Mar. 12, 1982, 57-38099; Oct. 4, 1982, 57-174400; Oct. 6, 1982, 57-175666

Int. Cl.[3] **C08K** *3/00*

U.S. Cl. 524—3 **9 Claims**

1. A sulfonation product of a polymer of a cyclopentadiene derivative represented by the formula (A) or (B):



(A)

or

(B)

wherein R_1 is a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, and R_2 and R_3, which may be identical or different, are hydrogen atoms or alkyl groups having 1 to 3 carbon atoms.

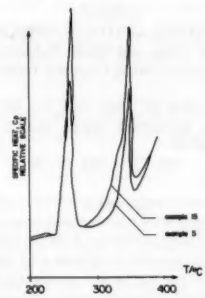
4,511,684
FLAME RETARDANT POLYAMIDES AND AGENT FOR INDUCING FLAME RETARDANCY

Eduard Schmid, Bonaduz, and Manfred Hoppe, Chur, both of Switzerland, assignors to Ems-Inventa AG, Zurich, Switzerland

Filed Dec. 15, 1982, Ser. No. 449,850

Int. Cl.[3] **C08K** *5/34;* **C07D** *403/00*

U.S. Cl. 524—101 **14 Claims**



1. A flame retardant thermoplastically processable material comprising

(A) at least one thermoplastically processable polyamide,

(B) a further thermoplast in an amount from 0% to about 45% by weight of the material, and

(C) a flame retarding agent which is a condensation product of

(i) cyanuric acid and

(ii) melamine, there being at least two molecules of melamine per molecule of cyanuric acid.

4,511,685
CHROMAN DERIVATIVES AND STABILIZED POLYPROPYLENE COMPOSITION

Axel Nissen, Leimen; Michael Horner, Neustadt; Dieter Horn, Heidelberg; Erik Lueddecke, and Gernot Teege, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

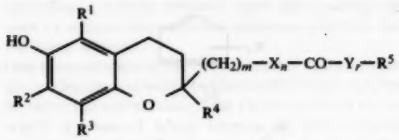
Filed Feb. 26, 1981, Ser. No. 238,593

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1980, 3010505

Int. Cl.[3] **C08K** *5/09;* **C07D** *311/72*

U.S. Cl. 524—110 **4 Claims**

1. A chroman derivative of the formula I



where R^1, R^2, R^3 and R^4 are each H or C_1–C_4-alkyl, R^5 is C_{10}–C_{30}-alkyl or C_{10}–C_{30}-alkenyl, X and Y are each O, NH or S, m is 0, 1, 2 or 3 and n and r are each 0 or 1.

3. A stabilized composition of matter comprising polypropylene and, as a stabilizer, from 0.01 to 20% by weight of a chroman derivative I as set forth in claim 1.

4,511,686

CYANOACRYLATE ADHESIVE COMPOSITION CONTAINING TANNINS

George H. Millet, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 14, 1983, Ser. No. 551,294

Int. Cl.³ C08F *15/02*

U.S. Cl. 524—110 **17 Claims**

1. A cyanoacrylate adhesive composition, comprising (a) ten weight percent or more of cyanoacrylate monomer, based on the weight of said adhesive composition, and (b) an effective amount of tannin.

4,511,687

POLYCAPROLACTONE COMPOSITION

Michio Nakanishi, Niiza, and Naoki Nakashima, Ohtake, both of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed May 28, 1982, Ser. No. 383,054

Claims priority, application Japan, Jun. 3, 1981, 56-85343; Jun. 4, 1981, 56-86039

Int. Cl.³ C08L *93/04*

U.S. Cl. 524—270 **5 Claims**

1. A synthetic resin composition which comprises a blend of (A) 100 parts by weight of polycaprolactone having a number-average molecular weight of from 5,000 to 200,000, with either (B-1) from 10 to 70 parts by weight of a moldable thermoplastic resin selected from the group consisting of polyethylene, polypropylene, vinyl chloride resin, ethylenevinyl acetate copolymer, moldable thermoplastic styrene resin, chlorinated polyethylene having a chlorine content of 25 to 45 wt.%, chlorinated polypropylene having a chlorine content of 15 to 35 wt.% and chlorinated polybutene, and 1 to 30 parts by weight of a tackifier selected from the group consisting of rosin, maleic rosin, ester gum, ester gum H, polyterpene resin, C_5 petroleum resin, C_9 petroleum resin, dicyclopentadiene petroleum resin, tackifying styrene resin different from said moldable thermoplastic styrene resin, alkylphenolic resin and terpene phenolic resin, or (B-2) 10 to 70 parts by weight of a chlorinated polyolefin selected from the group consisting of chlorinated polyethylene having a chlorine content of 25 to 45 wt.%, chlorinated polypropylene having a chlorine content of 15 to 35 wt.% and chlorinated polybutene.

4,511,688

FLAME RETARDANT FOR USE IN RIGID POLYURETHANE FOAMS

Enrico J. Termine, Pembroke Pines, Fla., and Sally P. Ginter, Sanford, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 29, 1984, Ser. No. 584,577

Int. Cl.³ C08G *18/14*

U.S. Cl. 524—380 **18 Claims**

1. A flame-retardant composition comprising:

(a) a sucrose polyol;

(b) an aromatic polyester polyol; and

(c) an amount of a halogenated, hydroxyl-containing derivative of pentaerythritol which is sufficient to impart a degree of flame retardancy to a rigid polyurethane foam prepared using said composition, such that the polyurethane can achieve a Class I or Class II rating according to the ASTM E-84 test.

4,511,689

BLENDS OF HARDENED EXTRACT WITH COPOLYMERS OF OLEFIN/ALKYL ACRYLATE

Alan C. G. Aldred, North Cheam, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Dec. 3, 1982, Ser. No. 446,567

Claims priority, application United Kingdom, Dec. 11, 1981, 8137530

Int. Cl.³ C08F *220/10*

U.S. Cl. 524—484 **9 Claims**

1. A blend of an olefin/alkyl acrylate copolymer and hardened extract, said hardened extract having a saturated hydrocarbon content of not more than 10% by weight and being obtained by blowing a gas containing free oxygen into a petroleum extract at elevated temperature, the petroleum extract having been obtained by the solvent extraction of a product of petroleum refining which product is a distillate petroleum fraction or a deasphalted petroleum residue, which product boils above 350° C. at atmospheric pressure and contains a major proportion of aromatic hydrocarbons.

4,511,690

REINFORCED COMPOSITES

Ike Y. Chang, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 7, 1984, Ser. No. 618,117

Int. Cl.³ C08K *3/04*

U.S. Cl. 524—606 **3 Claims**

1. A composite comprising a matrix formed of the homopolymer from bis(para-amino cyclohexyl)methane and dodecanedioic acid reinforced with from about 50 to 70% by volume of continuous filaments selected from the group of graphite and p-aramid filaments.

4,511,691

ADHESIVE LATEX POLYMERIZATION SURFACTANTS

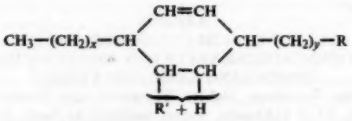
John W. Noble, Mt. Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 475,597, Mar. 15, 1983, Pat. No. 4,455,263. This application Feb. 16, 1984, Ser. No. 580,795

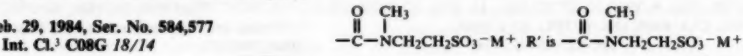
Int. Cl.³ C08K *5/41*

U.S. Cl. 524—745 **2 Claims**

1. A latex composition which comprises a latex polymer and at least one emulsion polymerization emulsifier having the general formula



where x and y are integers from 3 to 9, x and y together equal 12, R is



a carboxyl group (COOH), and M^+ is an alkali metal, ammonium or amine cation.

4,511,692

CATIONIC ELECTRODEPOSITION COMPOSITION

Jeffrey L. Anderson, Coon Rapids; Philip J. Ruhoff, and Robert B. Edenborg, both of Minneapolis, all of Minn., assignors to The Valspar Corporation, Minneapolis, Minn.

Filed Dec. 8, 1983, Ser. No. 559,385
Int. Cl.³ C09D 5/40, 3/64, 3/68
U.S. Cl. 525—7 42 Claims

1. A cationic electrodeposition coating composition comprising:

a reaction product of a base alkyd and ethylenically unsaturated momomers at least some of which are amine functional monomers, said base alkyd comprising the reaction product of a polyhydric alcohol, a polybasic acid, a fatty acid, and a grafting agent; and

said product including amine functional groups in a quantity to provide a water dispersible and cationically depositable composition.

4,511,693

POLYCARBONATE/ADDITION POLYMER BLENDS

Daniel W. Fox, Pittsfield; Edward N. Peters, Lenox, and Gary F. Smith, Pittsfield, all of Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 259,524, May 1, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 451,181
Int. Cl.³ C08L 69/00
U.S. Cl. 525—67 25 Claims

1. A thermoplastic resin composition comprising:

(a) a mixed polycarbonate comprising units derived from a first dihydric phenol, which is a bis(hydroxyaryl)sulfone, and a second dihydric phenol, said first and second dihydric phenols in a mole ratio of about 1:5 to 5:1; and

(b) one or more thermoplastic addition polymers comprising a styrene polymer, said composition having been admixed to produce a compatible composition.

4,511,694

HYDROPHILIC POLYMER CARRIER FOR PROTEINS

Dieter Krämer, Mainz; Horst Pennewiss, Darmstadt-Neu-Kranichstein; Hermann Plainer, Reinheim; Reiner Schnee, Darmstadt-Arheilgen, and Waldemar Schleier, Darmstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,524
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1981, 3106456
Int. Cl.³ C08F 2/06, 2/10, 2/14
U.S. Cl. 525—54.1 7 Claims

1. A method for making a pearl-like crosslinked hydrophilic carrier polymer capable of binding proteins, which method comprises inverse pearl polymerizing, by free radical polymerization, a monomer phase distributed as droplets in a non-aqueous organic medium, said monomer phase comprising a monomer mixture of

(1) 30 to 95 percent, by weight of the total weight of polymerizable monomers, of at least one compound selected from the group consisting of acrylamide, methacrylamide, methyl-bisacrylamide, and methylene-bis-methacrylamide,

(2) 0 to 65 percent of further hydrophilic free radically polymerizable conomers,

(3) 5 to 60 percent of at least one unsaturated free radically polymerizable monomer having an oxirane group, and

(4) 0 to 25 percent of at least one other free radically polymerizable comonomer of slight hydrophilicity, of which polymerizable monomers at least 5 percent by weight are monomers having at least two polymerizable double bonds, said monomer phase further including a diluent which is a mixture of

(A) at least one solvent selected from the group consisting of water, formamide, glycol, and dimethylsulfoxide, and

(B) at least one organic liquid different from (A) which forms a homogeneous phase with the aforesaid monomer mixture and with (A), has a molecular weight below 200, and contains at least 20 percent by weight of oxygen, as hydroxyl groups, (A) and (B) being present in said diluent mixture in a ratio such as forms a homogeneous phase with said monomer mixture and such that the monomer phase comprising said monomer mixture and diluent mixture is incompatible with, and suspended in, said non-aqueous organic medium.

4,511,695

SOFT POLYMER ALLOYS

Christian Lindner; Hans-Eberhard Braese, both of Cologne; Karl-Heinz Ott, and Walter Uerdingen, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,282
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1983, 3312542
Int. Cl.³ C08L 51/04
U.S. Cl. 525—80 4 Claims

1. A soft polymer alloy comprising

(A) from 95 to 20% by weight of a graft product of a mixture of from 20 to 40 parts by weight of acrylonitrile and from 80 to 60 parts by weight of styrene, α-methyl styrene, methyl methacrylate or mixtures thereof on a particulate, highly crosslinked diene or alkyl acrylate rubber having an average particle diameter, d_{50}, of from 0.1 to 2.0 μm, the total rubber content amounting to between 20 and 50% by weight, and

(B) from 5 to 80% by weight of a particulate, crosslinked rubber-like copolymer of an alkyl acrylate containing from 20 to 40% by weight of acrylonitrile, methyl methacrylate or both based on the weight of the copolymer and having an average particle diameter, d_{50}, of from 0.05 to 0.6 μm, a gel content of from 80 to 99% by weight, as measured in dimethyl formamide at 25° C., and a degree of swelling of from 10 to 40, as measured in dimethyl formamide at 25° C.

4,511,696

METHOD FOR PROTECTIVELY COATING A POLYMER

Daniel P. Durbin, and William H. Korcz, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 29, 1983, Ser. No. 508,776
Int. Cl.³ C08L 53/00, 77/00
U.S. Cl. 525—92 5 Claims

1. A method for protectively coating particles of a polymer selected from the group consisting of styrene, isoprene block copolymer formulations and styrene, butadiene block copolymer formulations, comprising interfacially polymerizing a second polymer onto the surface of said particles, wherein said second polymer is a condensation polymer selected from the group consisting of polyamides, polyurethanes, polyureas, polysulfonamides and poly(phenol esters).

4,511,697

RUBBER MIXTURE FOR DIRECT BONDING TO METAL SURFACES

Richard Sohnemann, Northeim, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 298,958, Sep. 3, 1981, abandoned. This application Feb. 22, 1983, Ser. No. 468,653
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033711
Int. Cl.³ C08L 61/12
U.S. Cl. 525—139 10 Claims

1. A rubber mixture for direct bonding to exposed metallic surfaces, said mixture including:

a rubber base selected from at least one of the group consisting of natural and synthetic rubbers;

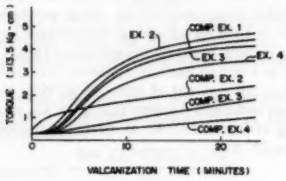
filler;
processing aids;
vulcanizing agent;
a bonding agent selected from the group consisting of phenol and its derivatives, said bonding agent forming phenolic resins with formaldehyde, and being present to the extent of 80–160 mMol per 100 g rubber base;
a source of formaldehyde; and additionally having the improvement in combination therewith that the mixture also contains:
additional metal oxides, the outer electron shell of which has 2s electrons, said additional metal oxides being present to the extent of 70–400 mMol per 100 g rubber to metal base for activating polymerization and a measured quantity of bonding agent increased in a range of from two to four times this extent of rubber base.

4,511,698

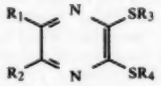
CURABLE COMPOSITION OF EPICHLOROHYDRIN RUBBER AND ACRYLIC RUBBER AND CURED COMPOSITION THEREFROM

Yasuo Matoba, Toyonaka, and Isao Ishimori, Kurashiki, both of Japan, assignors to Osaka Soda Co. Ltd., Osaka, Japan

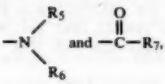
Filed Dec. 23, 1982, Ser. No. 452,736
Claims priority, application Japan, Dec. 25, 1981, 56-213922
Int. Cl.³ C08L *63/00*
U.S. Cl. 525—187 **10 Claims**



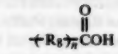
1. A curable composition of an epichlorohydrin rubber and an acrylic rubber composed of (1) 100 parts by weight of (a) 10–97% by weight of an epichlorohydrin rubber and (b) 3–90% by weight of an epoxy-containing acrylic rubber, (2) as a crosslinking agent, about 0.1 to about 10 parts by weight of a 2,3-dimercaptopyrazine or -quinoxaline compound having the following formula



wherein R_1 and R_2 are identical or different and represent a hydrogen atom or a C_1–C_8 alkyl group, or R_1 and R_2 are bonded together to form a benzene ring which may be substituted by at least one lower alkyl group; and R_3 and R_4 are identical or different and represent a member selected from the class consisting of a hydrogen atom,



or R_3 and R_4 are bonded together to form >C=O, in which R_5 and R_6 are identical or different and represent a hydrogen atom, a C_1–C_{12} alkyl group or a cyclohexyl group and R_7 represents a C_1–C_{18} alkyl group or



where R_8 represents a C_1–C_8 alkylene group, and (3) as an acid acceptor, about 0.1 to about 50 parts by weight of a compound of a metal of Group II or IVa of the periodic table.

4,511,699

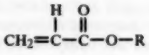
FLEXIBLE THERMOPLASTIC VINYL CHLORIDE POLYMERS AND ACRYLATE TERPOLYMERS

Earl G. Melby, Uniontown; Hubert J. Fabris; Russell A. Livigni, both of Akron, and Harry W. Cocain, Cuyahoga Falls, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 390,109, Jun. 21, 1982, Pat. No. 4,480,076.
This application Jan. 13, 1984, Ser. No. 570,730
Int. Cl.³ C08F *20/28, 20/26, 20/18;* C08L *27/06*
U.S. Cl. 525—205 **14 Claims**

1. The method which comprises aqueous free radical emulsion copolymerizing polymerizable monomers A, B and C to form a terpolymer in which the relative ratios of A, B and C to each other on a percent by weight basis are from about 24 to 94 of A, from about 1 to 75 of B and from about 1 to 20 of C, the total of A, B and C being 100, said emulsion optionally additionally containing a chain transfer agent in a minor amount sufficient to avoid formation of gel,

where A has the formula



where R is an alkyl group of from 4 to 8 carbon atoms and mixtures of A, said A as a homopolymer having a Tg not above −20° C.,

where B is selected from the group consisting of tetrahydrofurfuryl acrylate and tetrahydrofurfuryl methacrylate and mixtures of the same and

where C is selected from the group consisting of acrylonitrile, methacrylonitrile, N-vinyl-2-pyrrolidone and vinyl-alpha-methyl pyrrolidone and mixtures of the same.

4,511,700

FLEXIBLE THERMOPLASTIC VINYL CHLORIDE POLYMERS

Earl G. Melby, Uniontown; Hubert J. Fabris; Russell A. Livigni, both of Akron, and Harry W. Cocain, Cuyahoga Falls, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

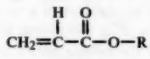
Division of Ser. No. 390,190, Jun. 21, 1982, Pat. No. 4,480,076.
This application Jan. 13, 1984, Ser. No. 570,720
Int. Cl.³ C08F *259/04*
U.S. Cl. 525—283 **9 Claims**

1. A flexible thermoplastic polymeric composition comprising a suspension polymerized vinyl chloride polymer graft or over suspension copolymerized with three copolymerizable monomers consisting essentially of A, B and C, the relative ratios of A, B and C to each other on a percent by weight basis being from about 24 to 94 of A, from about 1 to 75 of B and from about 1 to 20 of C, the total of A, B and C being 100, said vinyl chloride polymer being used in an amount of from about 40 to 60% by weight and said monomers A, B and C being used in a total amount of from 60 to 40% by weight,

where said vinyl chloride polymer is selected from the group consisting of homopolyvinyl chloride, a copolymer of vinyl chloride and vinyl acetate containing up to about 50% by weight of vinyl acetate, and a copolymer of vinyl chloride and vinylidene chloride containing up to about

50% by weight of vinylidene chloride and mixtures of the same,

where A has the formula



where R is an alkyl group of from 4 to 8 carbon atoms and mixtures of A, said A as a homopolymer having a Tg not above −20° C.,

where B is selected from the group consisting of methyl acrylate, ethyl acrylate, tetrahydrofurfuryl acrylate and tetrahydrofurfuryl methacrylate and mixtures of the same and

where C is selected from the group consisting of acrylonitrile, methacrylonitrile, N-vinyl-2-pyrrolidone and vinyl-alpha-methyl pyrrolidone and mixtures of the same.

4,511,701

HEAT CURABLE EPOXY RESIN COMPOSITIONS AND EPOXY RESIN CURING AGENTS

Hong-Son Ryang, Camarillo, Calif., assignor to General Electric Company, Schenectady, N.Y.

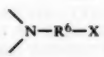
Filed Feb. 27, 1984, Ser. No. 584,068
Int. Cl.³ C08G *59/14*
U.S. Cl. 525—533 **2 Claims**

1. Curable epoxy resin compositions comprising

(A) an epoxy resin and

(B) an effective amount of organopolysiloxane curing agent having attached to silicon by carbon-silicon bonds at least one group of the formula,

where R—R^5 are members selected from hydrogen, halogen, $C_{(1-13)}$ monovalent hydrocarbon radicals and substituted $C_{(1-13)}$ monovalent hydrocarbon radicals, Z is selected from —O— and C—$(R)_2$ and Y is a member selected from —O— and



R^6 is a divalent $C_{(1-13)}$ hydrocarbon radical or substituted hydrocarbon radical and X is a monovalent amine radical.

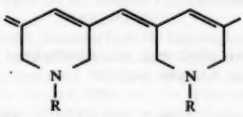
4,511,702

POLY(DIPROPARGYLAMINE) AND DERIVATIVES THEREOF PER SE AND P-DOPED AND PROCESSES FOR PREPARING SAME

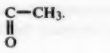
Yoshiyuki Okamoto, Fort Lee, N.J., and Edward F. Hwang, Brooklyn, N.Y., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 579,407, Feb. 13, 1984,. This application Aug. 10, 1984, Ser. No. 639,458
Int. Cl.³ C08F *4/22, 26/02, 38/00*
U.S. Cl. 526—90 **17 Claims**

1. Polymeric dipropargylamine and derivative compounds having recurring structural units of the formula:



wherein R is H, C_2H_5, $(CH_3)_3C$ or



4,511,703

CATALYSTS FOR THE POLYMERIZATION AND COPOLYMERIZATION OF PROPYLENE AND POLYMERIZATION PROCESSES USING THESE CATALYSTS

Jean C. Bailly, Martigues, France, assignor to BP Chimie Societe Anonyme, Paris, France

Filed Jun. 16, 1983, Ser. No. 504,981
Claims priority, application France, Jun. 24, 1982, 82 11056
Int. Cl.³ C08F *4/02, 10/06*
U.S. Cl. 526—125 **5 Claims**

1. Process for the polymerisation of propylene, or the copolymerisation of propylene with other alpha-olefins, in the presence of a catalyst, characterised in that the said catalyst comprises a support containing essentially magnesium chloride, or magnesium chloride with a chlorinated derivative of aluminum, and an electron donor compound, but no product comprising a Mg—C bond, this support having a density comprised between 1.2 and 2.1 and a specific surface area comprised between 20 and 60 m^2/g (BET), and occurring in the form of spheroidal particles, having a mean diameter by mass comprised between 10 and 100 microns and a particle size distribution such that the ratio of the mean diameter by mass, Dm, to the mean diameter by number, Dn, is less than or equal to 3, which support has been treated with an electron donor compound chosen from among the aromatic ethers and the esters of an aromatic acid, and which when impregnated with titanium tetrachloride comprises 0.5 to 3% of atoms of titanium per atom of magnesium,

and further characterised in that the said polymerisation or copolymerisation is carried out in the presence of a co-catalyst of the formula $Al(R_7)_3$, in which R_7 is an alkyl radical having 2 to 12 carbon atoms.

4,511,704

PROCESS FOR PRODUCING POLYOLEFIN

Toru Tanaka, Yamato; Nobuaki Gohko, Kurashiki; Osamu Kishiro, Atsugi, and Atsushi Murakami, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 337,508, Jan. 6, 1982, abandoned. This application Sep. 30, 1983, Ser. No. 537,165
Claims priority, application Japan, Jun. 25, 1981, 56-98639
Int. Cl.³ C08F *4/10*
U.S. Cl. 526—125 **2 Claims**

1. A process for producing a polyolefin which comprises polymerizing ethylene or copolymerizing ethylene and another α-olefin at 50° to 100° C. in a hydrocarbon solvent in the presence of a catalyst system comprising:

(1) an organoaluminum compound selected from the group consisting of an alkylaluminum chloride and a mixture of an alkylaluminum chloride and a trialkyl aluminum,

(2) a transition metal compound component which is a solid component containing a reaction product obtained by reacting an oxygen-containing organomagnesium compound represented by the formula:

$Mg(OR^1)_mX_{2-m}$

wherein

R^1 represents alkyl, aryl, or cycloalkyl,

X^1 represents halogen, and

m is 1 or 2

and tri-n-butoxytitanium monochloride with ethylaluminum sesquichloride;

wherein said process of polymerization comprises:

(a) two-step polymerization of a first polymerization step and a second polymerization step in the presence of a reaction mixture obtained by said first polymerization step;

(b) a polymerization in the presence of hydrogen at a molar ratio of H_2 to C_2H_4 (vapor phase) of 0.01–0.8 to produce a polymer A having a viscosity average molecular weight of 2×10^5–7×10^5 at a ratio of 30:70 weight percent based on the total polymer in one of said first or second polymerization step and a polymerization in the presence of hydrogen at a molar ratio of H_2 to C_2H_4 (vapor phase) of 1.5–15 to produce a polymer B having a viscosity average molecular weight of 1×10^4–4×10^4 at a ratio of 70:30 weight percent based on the total polymer in the other polymerization step to give a ratio of viscosity average molecular weight of polymer A to a viscosity average molecular weight of polymer B of 15:55;

(c) said production of said polymer A as a copolymer of ethylene and other -olefin and said production of said polymer B as a homopolymer of ethylene or a copolymer of ethylene and the other -olefin; and

(d) said production of the total polymer as a polymer having a melt index of less than 0.5 g/10 min.

4,511,705

COMPOSITION FOR PROTECTIVE COATING MATERIAL

Daisuke Makino; Hidetaka Sato; Hiroshi Suzuki; Shun-ichiro Uchimura, all of Hitachi, and Hiroshi Suzuki, Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd. and Hitachi, Ltd., both of Tokyo, Japan

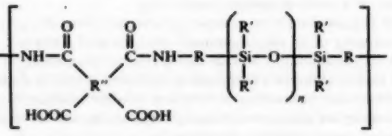
Continuation of Ser. No. 366,146, Apr. 7, 1982, abandoned. This application Jan. 5, 1984, Ser. No. 568,284

Claims priority, application Japan, Apr. 14, 1981, 56-56538

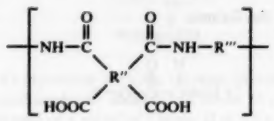
Int. Cl.³ C08G *77/04*

U.S. Cl. 528—26 **13 Claims**

1. A composition for use as a protective coating material in a protective coating layer for a semiconductor device having a high degree of integration, said device comprising a semiconductor memory element, a layer containing an inorganic material encapsulating said element and said protective coating layer arranged between said element and encapsulating layer, said composition comprising a polyamide acid having from 0.1 to 20 mole % of the recurring unit represented by formula (1) and 80 to 99.9 mole % of the recurring unit represented by formula (2), said composition being obtained by the reaction of a diaminosiloxane, an organic diamine containing no silicon and an organic tetrabasic acid dianhydride in the presence of an inert solvent wherein said compounds are pretreated prior to said reaction to remove uranium and thorium contained in said compounds;



-continued



wherein R is a divalent hydrocarbyl group; R' is a monovalent hydrocarbyl group; R'' is a tetravalent organic group; R''' is a divalent organic group which is a residue of an organic diamine containing no silicon; and n is an integer of 1 or more; and wherein said composition contains a combined amount of uranium and thorium of less than 0.2 part per billion.

4,511,706

COPOLYMERS OF A 4,4'-(ETHYLENEDIOXY)BIS BENZOATE, AN ALKYLENE DIOL AND A (2-ALKENYL OR ALKYL) SUCCINIC ANHYDRIDE

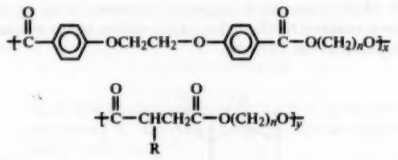
Shalaby W. Shalaby, Mountainville, and Dennis D. Jamiolkowski, Long Valley, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jul. 26, 1982, Ser. No. 401,494

Int. Cl.³ C08G *63/66*

U.S. Cl. 528—192 **7 Claims**

1. A copolymer consisting essentially of a multiplicity of recurring A and B units having the following general formula:



wherein

x and y are numbers having average values such that the B units comprise from 1 to 55 weight percent of the copolymer, and the A units comprise the remainder,

n is 2 to 8, and

R represents a linear or branched alkyl or alkenyl radical with a chain length of 4 to 30 carbon atoms, or a mixture of such radicals with different chain lengths.

4,511,707

WATER-SOLUBLE PRECONDENSATES USEFUL FOR IMPROVING THE FASTNESS OF DYES AND OPTICAL BRIGHTENERS ON HYDROXY GROUP-CONTAINING SUBSTRATES

James R. Runyon, Oberwil, and Salvatore Valenti, Binningen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 376,901, May 10, 1982, Pat. No. 4,439,203. This application Jan. 25, 1984, Ser. No. 573,647

Int. Cl.³ C08G *12/10;* **D06M** *15/54;* **C08G** *59/10*

U.S. Cl. 528—250 **20 Claims**

1. A water-soluble precondensate selected from the group consisting of

I. a product produced by reacting (A) with (B) in aqueous solution at an initial pH of 6 to 9,

II. a product produced by reacting (A) with (B) and (E), and

III. a product produced by reacting (A) with (C) and (E), wherein

(A) is the product of reacting a mono- or polyfunctional primary or secondary amine with dyanamide, dicyandiamide, guanidine or biguanidine; with the proviso that up to 50 mole % of the cyanamide, dicyandiamide, guanidine

or biguanide may be replaced with a dicarboxylic acid or a mono- or di-ester thereof, said product (A) containing reactive hydrogen atoms bound to nitrogen,

(B) is an epihalohydrin or a precursor thereof,

(C) is formaldehyde or a formaldehyde precursor, and

(E) is an N-methylol derivative of a urea, melamine, guanamine, triazinone, urone, carbamate or acid amide.

4,511,708

PROCESS FOR MANUFACTURING POLYTETRAMETHYLENE TEREPHTHALATE

Takuzo Kasuga; Katsuhiko Takahashi, and Kunio Suzuki, all of Fuji, Japan, assignors to Polyplastics Company, Ltd., Osaka, Japan

Filed Jan. 31, 1984, Ser. No. 575,414
Claims priority, application Japan, Feb. 1, 1983, 58-15172
Int. Cl.³ C08G *63/04, 63/22*
U.S. Cl. 528—274 **16 Claims**

1. A process for manufacturing polytetramethylene terephthalate, comprising subjecting terephthalic acid and 1,4-butanediol to an esterification reaction in the presence of an esterification catalyst and then conducting a condensation-polymerization reaction of the esterification reaction product, the esterification reaction being carried out in the presence of at least one acid amide compound selected from the group consisting of urea, a derivative thereof, mono-carboxylic acid amides having 1 to 9 carbon atoms, poly-carboxylic acid amides having 1 to 9 carbon atoms, polyamides, phosphoric acid amides and sulfonic acid amides.

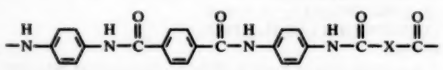
4,511,709

WHOLLY AROMATIC OR ALIPHATIC AROMATIC BLOCK COPOLYAMIDES AND PROCESS THEREFOR

Han S. Yoon, and Wha S. Lee, both of Seoul, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea

Division of Ser. No. 313,166, Oct. 20, 1981, abandoned. This application Feb. 15, 1983, Ser. No. 466,616
Int. Cl.³ C08G *69/12*
U.S. Cl. 528—331 **10 Claims**

1. A fiber or filament forming block copolymer consisting essentially of the recurrent units:

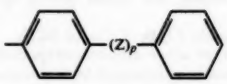


wherein

said block copolymer has a softening point greater than 350° C. and

X is selected from one of the group consisting of $-(CH_2)_m$ wherein m is 4, 6, 8 or 10

substituted in the meta or para position, or



wherein Z is $C(CH_3)_2$, oxygen, or SO_2 and p is 0 or 1.

4,511,710

HALIDE REMOVAL FROM FLUID ORGANIC MATERIALS

Chun S. Wang, Lake Jackson; Kyle B. Benkendorfer, and John L. Burba, III, both of Angleton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 11, 1984, Ser. No. 619,440
Int. Cl.³ C08G *59/14;* C08F *6/28*
U.S. Cl. 528—485 **13 Claims**

1. A method for reducing the halogen content of a liquid resin, organic or hydrocarbon material which contains unwanted halogen values, said method comprising

intimately contacting said material with a halogen scavenger,

then separating said scavenger from said material, wherein said scavenger comprises a particulate crystalline lithium aluminate compound which conforms, generally, to the empirical formula

$$(LiX_x)_y 2Al(OH)_3 \cdot nH_2O$$

where X is at lease one anion or negative-valence radical other than halide, x is an amount of X sufficient to substantially satisfy the valence requirements of Li in the crystal structure, y is a positive amount of Li at least sufficient to maintain the crystal structure, and n represents a numerical amount of zero or more for waters of hydration.

4,511,711

PROCESS FOR PRODUCING SEMIPERMEABLE MEMBRANE

Takatoshi Shimomura, Ibaraki; Fumio Fujita, Osaka, and Manabu Hirakawa, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 2, 1983, Ser. No. 463,243
Claims priority, application Japan, Feb. 10, 1982, 57-20316; Feb. 12, 1982, 57-21633
Int. Cl.³ C08F *6/00*
U.S. Cl. 528—489 **2 Claims**

1. A process for producing a semipermeable membrane which comprises dipping a semipermeable membrane of acrylonitrile polymer containing 40–100% by mole of acrylonitrile in a solution of sodium hydroxide or potassium hydroxide and thereafter treating it with plasma.

4,511,712

METHOD FOR ISOLATING IONOMERS IN THE SALT FORM

Robert A. Florence, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 21, 1984, Ser. No. 581,756
Int. Cl.³ C08F *6/00;* C08G *00/00;* C08J *3/00*
U.S. Cl. 528—488 **20 Claims**

1. A method of isolating ionomers in the salt form from a solution of at least one such ionomer in an organic solvent,

said ionomer comprising a substantially aromatic polymer or a carbon atom backbone elastomer and having ionic substituents selected from the group consisting of sulfonate, carboxylate, alkylammonium and quaternary ammonium groups,

which comprises precipitating said ionomer by blending said solution with a solution, in an organic liquid which is substantially a non-solvent for said ionomer, of at least one salt in which the counterion is identical to that of said ionomer or below it in the ion affinity sequence, and removing the precipitated ionomer.

4,511,713

PROCESS FOR SELECTIVELY CONTROLLING UNWANTED EXPRESSION OR FUNCTION OF FOREIGN NUCLEIC ACIDS IN ANIMAL OR MAMMALIAN CELLS

Paul S. Miller, Baltimore, and Paul O. P. Ts'O, Lutherville, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 206,297, Nov. 12, 1980, Pat. No. 4,469,863. This application Mar. 29, 1982, Ser. No. 363,230

Int. Cl.[3] **C07H** *15/12, 17/00*

U.S. Cl. 536—27 **5 Claims**

1. A process for selectively controlling or interfering with the effect or function of foreign nucleic acid in the presence of otherwise normal living cells which comprises determining the base sequence for said nucleic acid and binding the said nucleic acid with an appropriately prepared nonionic oligonucleoside alkyl or arylphosphonate analogue which is complementary to the indicated sequence of the foreign nucleic acid.

4,511,714

HERBICIDAL ANTIDOTE COMPOSITIONS

Katalin Görög; Erzébet Dudar; Iván Gárdi; Mária Kocsis; Sándor Gaál, and Márta Tasnádi, all of Budapest, Hungary, assignors to Nitrokemia Ipartelepek, Fuzfogyartelep, Hungary

Continuation-in-part of Ser. No. 354,070, Mar. 2, 1982, , which is a continuation of Ser. No. 181,741, Aug. 26, 1980,. This application Mar. 17, 1983, Ser. No. 476,240

Int. Cl.[3] **C07D** *263/00*

U.S. Cl. 548—215 **4 Claims**

1. Phthalic acid-bis-(2,2-dimethyl-1,3-oxazolidine).

4,511,715

PLATINUM-NITROGEN COMPLEX CATALYSTS

Frederick J. Palensky, St. Paul, and Allen R. Siedle, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 245,927, Mar. 20, 1981, abandoned. This application Jul. 27, 1982, Ser. No. 402,231

Int. Cl.[3] **C07F** *15/00;* **B01J** *31/24, 31/22*

U.S. Cl. 544—225 **22 Claims**

1. A platinum-nitrogen complex compound selected from classes of complexes having the formulae:
(a) monometallic complexes, $(L)PtX_2(Y)$,
(b) bimetallic complexes, $(L)(PtX_2)_2(Y)_2$,
(c) ionic complexes, $(L)PtX_2(Y)(Z)$, and
(d) reduced forms of said monometallic complexes having the formulae:
(1) $H[(PNZ)PtX_2(Q)]_2$,
(2) $[(PNZ)PtX_2(Q)]_2{}^-A^+$, and
(3) $[H(PNZ)PtCl_2(C_2H_4)]_3PtCl_3$
wherein
L is a single ring or fused 2- to 6-ring unsaturated heterocyclic ligand wherein said hetero atoms are nitrogen, said ligand having only 2 to 4 nitrogen atoms in exactly one 6-membered ring, at least one of which nitrogen atoms is bonded to a platinum atom, ligand L being selected from 5- and 6-member rings, and said ligand having up to a total of 26 ring atoms and can be unsubstituted or substituted by phenyl or lower alkyl groups for a total of up to 44 carbon atoms,
Y is a monodentate ligand that fills only one coordination position of the platinum atom and is selected from (1) olefinically unsaturated hydrocarbons, (2) triarylphosphines or triarylarsines wherein aryl is phenyl or phenyl substituted by up to 4 ower alkyl groups having 1 to 4 carbon atoms, (3) dialkyl sulfides wherein each alkyl group independently has 1 to 16 carbon atoms, and (4) carbon monoxide, the ligand having up to 25 carbon atoms,
X is independently Cl, Br, I, Cn, or SCN,
Z is HCl, HBr, or silver trifluoromethanesulfonate,
Q is an olefinically unsaturated hydrocarbon ligand of 2 to 25 carbon atoms,
A is a solubilizing cation, and
PNZ is phenazine.

21. A platinum-nitrogen complex compound selected from classes of complexes having the formulae:
(a) monometallic complexes, $(L)PtX_2(Y)$,
(b) bimetallic complexes, $(L)(PtX_2)_2(Y)_2$,
(c) ionic complexes, $(L)PtX_2(Y)(Z)$, and
(d) reduced forms of said monometallic complexes having the formulae:
(1) $H[(PNZ)PtX_2(Q)]_2$,
(2) $[(PNZ)PtX_2(Q)]_2{}^-A^+$, and
(3) $[H(PNZ)PtCl_2(C_2H_4)]_3PtCl_3$
wherein
L is a single ring or fused 2- to 6-ring unsaturated heterocyclic ligand wherein said hetero atoms are nitrogen, said ligand having only 3 nitrogen atoms in exactly one 5-member ring, at least one of which nitrogen atoms is bonded to a platinum atom, ligand L being selected from 5- and 6-member rings, and said ligand having up to a total of 26 ring atoms and can be unsubstituted or substituted by phenyl or lower alkyl groups for a total of up to 44 carbon atoms,
Y is a mondentate ligand that fills only one coordination position of the platinum atom and is selected from (1) olefinically unsaturated hydrocarbons, (2) triarylphosphines or triarylarsines wherein aryl is phenyl or phenyl substituted by up to 4 lower alkyl groups having 1 to 4 carbon atoms, (3) dialkyl sulfides wherein each alkyl group independently has 1 to 16 carbon atoms, and (4) carbon monoxide, the ligand having up to 25 carbon atoms,
X is independently Cl, Br, I, CN, or SCN,
Z is HCl, HBr, or silver trifluoromethanesulfonate,
Q is an olefinically unsaturated hydrocarbon ligand of 2 to 25 carbon atoms,
A is a solubilizing cation, and
PNZ is phenazine.

22. A platinum-nitrogen complex compound selected from classes of complexes having the formulae:
(a) monometallic complexes, $(L)PtX_2(Y)$,
(b) bimetallic complexes, $(L)(PtX_2)_2(Y)_2$,
(c) ionic complexes, $(L)PtX_2(Y)(Z)$, and
(d) reduced forms of said monometallic complexes having the formulae:
(1) $H[(PNZ)PtX_2(Q)]_2$,
(2) $[(PNZ)PtX_2(Q)]_2{}^-A^+$, and
(3) $[H(PNZ)PtCl_2(C_2H_4)]_3PtCl_3$
wherein
L is a single ring or fused 2- to 6-ring unsaturated heterocyclic ligand wherein said hetero atoms are nitrogen, said ligand having only 4 nitrogen atoms in exactly one 5-membered ring, at least one of which nitrogen atoms is bonded to a platinum atom, ligand L being selected from 5- and 6-member rings, and said ligand having up to a total of 26 ring atoms and can be unsubstituted or substituted by phenyl or lower alkyl groups for a total of up to 44 carbon atoms,
Y is a monodentate ligand that fills only one coordination position of the platinum atom and is selected from (1) olefinically unsaturated hydrocarbons, (2) triarylphosphines or triarylarsines wherein aryl is phenyl or phenyl substituted by up to 4 lower alkyl groups having 1 to 4 carbon atoms, (3) dialkyl sulfides wherein each alkyl group independently has 1 to 16 carbon atoms, and (4) carbon monoxide, the ligand having up to 25 carbon atoms,
X is independently Cl, Br, I, Cn, or SCN,
Z is HCl, HBr, or silver trifluoromethanesulfonate,
Q is an olefinically unsaturated hydrocarbon ligand of 2 to 25 carbon atoms,
A is a solubilizing cation, and

PNZ is phenazine.

4,511,716
METHOD OF PREPARING ADENINE

Kju H. Shin, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 357,009, Mar. 11, 1982, abandoned. This application Feb. 4, 1983, Ser. No. 463,962
The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.
Int. Cl.³ C07D *432/32*
U.S. Cl. 544—277 **10 Claims**

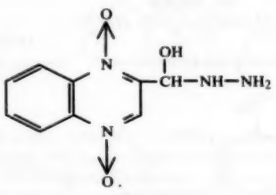
1. In a process for preparing adenine by the reaction of hydrogen cyanide, formamide, an ammonium salt, and methyl-disulfide, the improvement which comprises (1) heating a reaction mixture comprising the formamide and ammonium salt in a closed vessel to a reaction temperature of about 50°–180° C., (2) adding the hydrogen cyanide to the preheated mixture over a period of about 1–5 hours, and (3) maintaining the reaction temperature until the reaction is complete.

4,511,717
2-HYDROXYMETHYL-QUINOXALINE-1,4-DIOXIDE DERIVATIVES, A PROCESS FOR PREPARING SAME AND COMPOSITIONS CONTAINING SAME

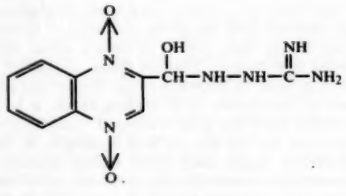
Pál Benkó; Ildikó Rátz née Simonek; László Pallos; Károly Magyar; Jenö Kovács; Erzsébet Mátrai; Janos Gundel, all of Budapest, and Albert Balogh, Szentendre, all of Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

PCT No. PCT/HU81/00038, § 371 Date May 7, 1982, § 102(e) Date May 7, 1982, PCT Pub. No. WO82/01001, PCT Pub. Date Apr. 1, 1982
Continuation of Ser. No. 380,741, May 7, 1982, abandoned. This PCT application Sep. 11, 1981, Ser. No. 593,204
Claims priority, application Hungary, Sep. 12, 1980, 2239/80
Int. Cl.³ C07D *241/52, 403/12, 401/12*; A61K *31/495*
U.S. Cl. 544—353 **4 Claims**

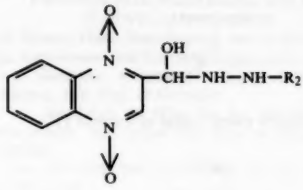
1. A compound of the formula



2. A compound of the formula

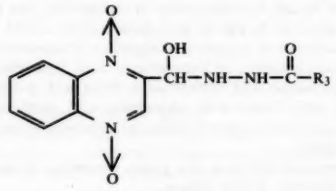


3. A compound of the formula



wherein R_2 is C_1–C_6 alkyl, phenyl, benzyl, hydroxy, or hydroxy-(C_2–C_4)-alkyl.

4. A compound of the formula



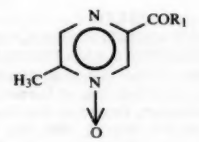
wherein R_3 is C_1–C_{20} alkyl, phenyl unsubstituted or substituted by one, two or three identical or different substituents selected from the group consisting of nitro, hydroxy, amino, C_1–C_3 alkoxy, and halogen, or R_3 is naphthyl, hydroxy-naphthyl, phenyl-(C_1–C_3)-alkyl, pyridyl, piperidyl, pyrazinyl, pyrimidyl, 1,2,4-triazinyl, furyl, nitro-furyl, or alpha, alpha-diphenyl-alpha-hydroxymethyl.

4,511,718
PREPARATION OF PYRAZINE DERIVATIVES

Giuseppe Ribaldone, Gallarate; Maria G. Felicioli, Novara; Claudio Santini, Novara, and Giovanni Agnes, Novara, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

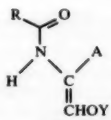
Filed Mar. 3, 1983, Ser. No. 471,691
Claims priority, application United Kingdom, Mar. 8, 1982, 8206772
Int. Cl.³ C07D *241/14, 401/02, 413/02, 417/02*
U.S. Cl. 544—406 **8 Claims**

1. A process for the preparation of a pyrazine of formula I:



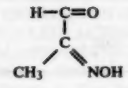
I

wherein R_1 is C_1–C_6 alkoxy, comprising:
(a) reacting a compound of formula II



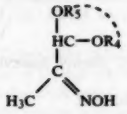
II

wherein R is selected from the group consisting of H, C_1–C_6 alkyl, and C_1–C_6 alkoxy; Y is selected from the group consisting of sodium ion, lithium ion and potassium ion; and A is COR_1; wherein R_1 is as defined above; with pyruvic aldehyde oxime of formula III,



III

or a pyruvic aldehyde oxime acetal of formula IV



IV

wherein R_4 and R_5 independent of one another, are H or C_1–C_6 alkyl; or R_4 and R_5 may form a cyclic acetal;

in the presence of an organic or inorganic acid selected from the group consisting of hydrochloric acid, hydrobromic acid, hydroiodic acid, sulfuric acid, nitric acid, p-toluene sulfonic acid, formic acid, phosphoric acid, methanesulphonic acid, trifluoroacetic acid, and trifluoromethanesulphonic acid;

in a solvent selected from the group consisting of water, R_7OH alcohols, R_7OR_6 ethers,

ketones, $R_7CO_2R_6$ esters or organic acids; wherein both R_7 and R_6, independent of one another, are a hydrogen atom, branched or linear C_1–C_6 alkyl or R_6 and R_7 together may form a cyclic C_1–C_6 alkyl, cyclic ether, cyclic ketone, or lactone;

at a temperature of from about 15° C. to about the boiling point of the solvent.

4,511,719

Nα-(3-CYANOPROPANOYL)-AMINOCARBOXYLIC ACID DERIVATIVES AND THEIR USE

Axel Kleemann, Hanau; Jürgen Martens, Alzenau, and Horst Weigel, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

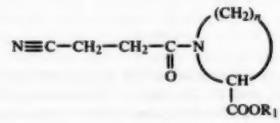
Division of Ser. No. 381,876, May 25, 1982, Pat. No. 4,426,532. This application Oct. 28, 1983, Ser. No. 546,366

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124091

Int. Cl.³ C07D *205/04, 207/12, 211/40*

U.S. Cl. 546—245 **4 Claims**

1. An Nα-(3-cyanopropanoyl)-aminocarboxylic acid derivative of the formula



(I)

where R_1 is hydrogen, methyl, ethyl, or benzyl, n is 2, 3 or 4.

4,511,720

2-IMINO-IMIDAZOLIDINE DERIVATIVES

Henri Ramuz, Birsfelden, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

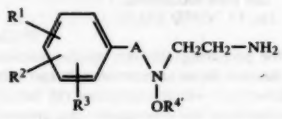
Division of Ser. No. 178,223, Aug. 14, 1980, Pat. No. 4,355,033, which is a division of Ser. No. 958,300, Nov. 6, 1978, Pat. No. 4,244,957. This application Aug. 5, 1982, Ser. No. 405,476

Claims priority, application Luxembourg, Nov. 7, 1977, 78,467; Switzerland, Sep. 15, 1978, 9668/78

Int. Cl.³ C07D *401/00, 233/54*

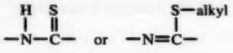
U.S. Cl. 546—273 **5 Claims**

1. A compound of the formula



V

wherein A is



R^1, R^2 and R^3, independently, are hydrogen, alkyl, alkoxy, alkylthio, halogen, trifluoromethyl, cyano or hydroxy and R^4 is aryl selected from the group consisting of imidazolyl, isoxazolyl, isothiazolyl, and pyridyl, which is bonded via a $CH(R^5)$-group and is optionally substituted by alkyl and R^5 is hydrogen, methyl, ethyl or n-propyl, wherein the term alkyl denotes straight-chain and branched alkyl of 1–6 carbon atoms, and alkoxy denotes straight-chain and branched alkoxy of 1–6 carbon atoms.

4,511,721

INTERMEDIATE FOR PREPARING ANTIFUNGAL 1,2-DIHYDROPYRIDO[3,4-b]-PYRAZINES

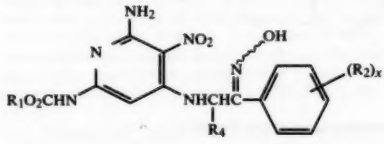
Carroll G. Temple, Jr.; John A. Montgomery; Robert D. Elliott, and Glynn P. Wheeler, all of Birmingham, Ala., assignors to Southern Research Institute, Montgomery, Ala.

Division of Ser. No. 354,164, Mar. 3, 1982, Pat. No. 4,450,160, which is a continuation-in-part of Ser. No. 327,928, Dec. 7, 1981, abandoned, which is a continuation-in-part of Ser. No. 247,158, Mar. 24, 1981, abandoned. This application Jan. 17, 1984, Ser. No. 571,500

Int. Cl.³ C07D *213/76, 213/75*

U.S. Cl. 546—308 **11 Claims**

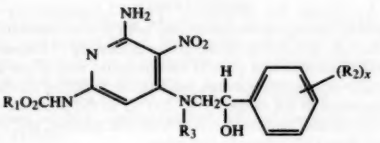
1. A compound having the formula:



wherein x has a value of 1, 2 or 3, R_1 is a lower alkyl group, R_2 is a member selected from the group consisting of hydrogen, alkyl radicals having from one to 12 carbon atoms, alkenyl radicals having from two to 15 carbon atoms, cycloalkyl radicals having from three to 20 carbon atoms, aralkyl and alkaryl radicals having from seven to 20 carbon atoms, a halogen radical, provided that when x has a value of 1 and R_2 is in the para position and R_3 and R_4 are both hydrogen, R_2 is not chlorine; hydroxyl, amino, thiol, nitro, alkoxy, aryloxy, carboxyl, alkylcarboxyl radicals having from one to 10 carbon atoms, alkylthio and arylthio radicals having from one to 20 carbon atoms, a sulfonic acid group, alkylsulfonyl and arylsul-

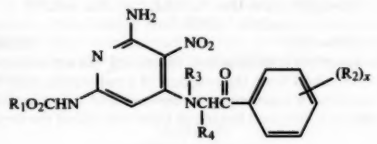
fonyl radicals having from one to 20 carbon atoms, alkylsulfinyl and arylsulfinyl radicals having from one to 20 carbon atoms, alkylamino and arylamino radicals having from one to 20 carbon atoms, and, when taken together with the aromatic ring to which it is attached, naphthyl; and R_4 is hydrogen or a lower alkyl group.

5. A compound having the formula:



wherein x has a value of 1, 2 or 3, R_1 is a lower alkyl group, R_2 is a member selected from the group consisting of hydrogen, alkyl radicals having from one to 12 carbon atoms, alkenyl radicals having from two to 15 carbon atoms, cycloalkyl radicals having from three to 20 carbon atoms, aralkyl and alkaryl radicals having from seven to 20 carbon atoms, a halogen radical, provided that when x has a value of 1 and R_2 is in the para position and R_3 and R_4 are both hydrogen, R_2 is not chlorine; hydroxyl, amino, thiol, nitro, alkoxy, aryloxy, carboxyl, alkylcarboxyl radicals having from one to 10 carbon atoms, alkylthio and arylthio radicals having from one to 20 carbon atoms, a sulfonic acid group, alkylsulfonyl and arylsulfonyl radicals having from one to 20 carbon atoms, alkylsulfinyl and arylsulfinyl radicals having from one to 20 carbon atoms, alkylamino and arylamino radicals having from one to 20 carbon atoms, and, when taken together with the aromatic ring to which it is attached, naphthyl; and R_3 is hydrogen or a lower alkyl group.

7. A compound having the formula:



wherein x has a value of 1, 2 or 3, R_1 is a lower alkyl group, R_2 is a member selected from the group consisting of hydrogen, alkyl radicals having from one to 12 carbon atoms, alkenyl radicals having from two to 15 carbon atoms, cycloalkyl radicals having from three to 20 carbon atoms, aralkyl and alkaryl radicals having fom seven to 20 carbon atoms, a halogen radical, provided that when x has a value of 1 and R_2 is in the para position and R_3 and R_4 are both hydrogen, R_2 is not chlorine; hydroxyl, amino, thiol, nitro, alkoxy, aryloxy, carboxyl, alkylcarboxyl radicals having from one to 10 carbon atoms, alkylthio and arylthio radicals having from one to 20 carbon atoms, sulfonic acid group, alkylsulfonyl and arylsulfonyl radicals having from one to 20 carbon atoms, alkylsulfinyl and arylsulfinyl radicals having from one to 20 carbon atoms, alkylamino and arylamino radicals having from one to 20 carbon atoms, and, when taken together with the aromatic ring to which it is attached, naphthyl; and R_3 and R_4 are either both hydrogen or one is hydrogen and the other is a lower alkyl group.

4,511,722
PROCESS FOR PREPARING CYCLIC N-VINYLACYLAMINES

Heinrich Krimm; Hans-Josef Buysch, both of Krefeld; Peter M. Lange, Leverkusen, and Reinhold Klipper, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

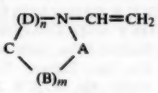
Filed Feb. 16, 1983, Ser. No. 466,807

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3207031

Int. Cl.[3] **C07D** *263/20, 209/40, 207/12, 233/32*

U.S. Cl. 548—231 **8 Claims**

1. A process for preparing a cyclic N-vinylacylamine of the formula (I)



(I)

wherein

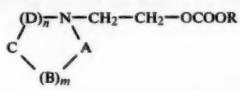
A and D denote the CO group,

B represents oxygen or the NH group,

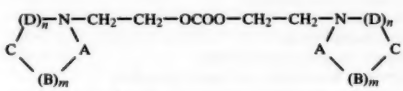
C represents a saturated hydrocarbon radical having 1 to 3 carbon atoms or a benzene ring which can be partially or completely hydrogenated, and

m and n independently of each other denote 0 or 1 and where the number of ring members is 5 or 6,

which comprises heating a carbonic acid ester of a cyclic N-hydroxyethylacylamine of either formula (II) or (III) below



(II)



(III)

in which

A, B, C, D m and n have the previously assigned significance and

R represents a saturated hydrocarbon radical having 1 to 4 carbon atoms,

at a temperature of 120° to 250° C. in the presence of a catalytic amount of at least one alkali or alkaline earth metal compound having an alkaline reaction and thereafter separating off the reaction product by distillation.

4,511,723
HALOGENATED 1-HYDROXYPYRAZOLES

Norbert Rieber, Mannheim; Heinrich Boehm, Neuhofen, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

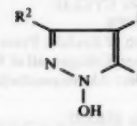
Division of Ser. No. 465,269, Feb. 9, 1983,. This application Apr. 6, 1984, Ser. No. 597,663

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205455; Feb. 16, 1982, 3205456

Int. Cl.[3] **C07D** *231/18*

U.S. Cl. 548—376 **1 Claim**

1. A halogenated 1-hydroxypyrazole of the formula



(I)

where R^1, R^2 and R^3 independently of one another are hydrogen, chlorine, bromine or iodine, with the proviso that R^1, R^2 and R^3 are not all hydrogen.

4,511,724

5-(PYRROL-2-OYL)-1,2-DIHYDRO-3H-PYRROLO [1,2-A]PYRROLE DERIVATIVES AS ANTI-INFLAMMATORY AND ANALGESIC AGENTS

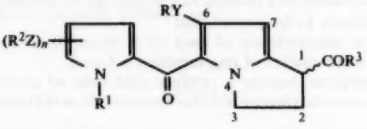
Michael N. Chang, and Tesfaye Biftu, both of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 387,079, Jun. 10, 1982, abandoned. This application Dec. 13, 1982, Ser. No. 449,302

Int. Cl.[3] **C07D** *487/06;* **A61K** *31/40*

U.S. Cl. 548—452 **8 Claims**

1. A compound of the structural formula:



(I)

or a pharmaceutically acceptable salt thereof wherein

R is

(a) hydrogen;
(b) loweralkyl;
(c) lowercycloalkyl;
(d) lower(cycloalkyl-alkyl);
(e) loweralkenyl;
(f) halo-loweralkyl; or
(g) phenyl- or phenyl-loweralkyl;

R^1 is hydrogen; loweralkyl; or lower haloalkyl;

R^2Z can be at any available positions and R^2 is R as previously defined;

n is 1 to 3;

R^3 is

(a) hydroxy;
(b) loweralkoxy;
(c) amino;
(d) loweralkylamino;
(e) di(loweralkyl)amino;
(f) morpholinyl;
(g) bis(hydroxyloweralkyl)amino;
(h) loweralkylcyclohexylamino;
(i) glucosamino;
(j) lower(alkanoyloxyalkoxy);
(k) aroyloxyloweralkoxy;
(l) lower(alkoxycarbonyloxyalkoxy);
(m) aryloxycarbonyloxyloweralkoxy;
(n) tri(loweralkylamino)loweralkoxy;
(o) lower(alkanoylaminoalkoxy);
(p) imidoloweralkoxy;
(q) hydroxyloweralkoxy;
(r) loweralkoxyalkoxy;
(s) di(loweralkylamino)loweralkoxy;
(t) N-pyrrolidinylloweralkoxy;
(u) N-piperidinylloweralkoxy;
(v) N-morpholinylloweralkoxy; or
(w) 4-methyl-1-piperazinylloweralkoxy

Y is CH_2 or H with the proviso that when Y is H, R is not present;

Z is —O—, a sulfur-containing group selected from a group of —S—, —SO—and —SO_2—, —NH— or halo providing that when Z is halo, R is not present.

4,511,725

PREPARATION OF N-ACYL-2,5-DIMETHYLPYRROLES FROM AMIDES AND ACETONYLACETONE

Ingenuin Hechenbleikner, West Cornwall, and William P. Enlow, Falls Village, both of Conn., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Jan. 17, 1983, Ser. No. 458,603

Int. Cl.[3] **C07D** *207/327*

U.S. Cl. 548—530 **5 Claims**

1. A process for preparing N-acyl-2,5-dimethylpyrroles comprising mixing acetonylacetone with a 1–20 carbon atom carboxamide selected from the group consisting of formamide, alkylcarboxamides and phenyl carboxamide and a non-aqueous, water-immiscible solvent, heating the resulting mixture at a temperature in the range 75° to 200° C. in the presence of an acid catalyst and removing water from the mixture, and isolating said N-acyl-2,5-dimethylpyrroles.

4,511,726

PRODUCTION METHOD OF AN INSECT PHEROMONE

Kenji Mori, Tokyo, and Tamon Uematsu, Funabashi, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 14, 1982, Ser. No. 449,748

Claims priority, application Japan, Dec. 24, 1981, 56-214181; Dec. 28, 1981, 56-211415; Feb. 17, 1982, 57-25168; Mar. 17, 1982, 57-43599; Mar. 23, 1982, 57-46938; Mar. 23, 1982, 57-46939

Int. Cl.[3] **C07D** *311/02*

U.S. Cl. 549—283 **2 Claims**

1. 1,5,5-Trimethyul-7-endo-hydroxy-4-oxabicyclo-[4.2.0]octan-3-one.

2. (+)-1,5,5-Trimethyl-7-endo-hydroxy-4-oxabicyclo-[4.2.0]octan-3-one.

4,511,727

QUATERNARY AMMONIUM-FUNCTIONAL SILICON COMPOUNDS

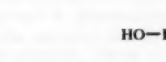
Eugene R. Martin, Adrian, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Division of Ser. No. 380,493, May 21, 1982, Pat. No. 4,384,130. This application Dec. 7, 1982, Ser. No. 447,547

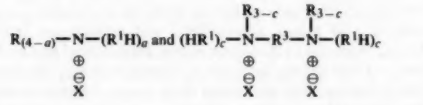
Int. Cl.[3] **C07F** *7/08, 7/10*

U.S. Cl. 556—418 **8 Claims**

1. A quaternary ammonium functional silicon compound which is obtained from the reaction of a carboxylic acid-functional quaternary ammonium compound and a carbinol-functional silicon compound having at least one unit of the formula



said carboxylic acid-functional quaternary ammonium compound is obtained from the reaction of a carbinol-functional quaternary ammonium compound selected from the group consisting of



with a dicarboxylic acid or anhydride thereof, in which R is a monovalent hydrocarbon radical having from 1 to 22 carbon

atoms, R^1 is a hydrocarbonoxy radical represented by the formula $(-C_nH_{2n}O)_n$, R^3 is a divalent hydrocarbon radical having from 2 to 10 carbon atoms, R^4 is a radical selected from the group consisting of saturated divalent hydrocarbon radicals and divalent hydrocarbonoxy radicals in which the oxygen is in the form of an ether linkage, X is an anion, a is a number of from 1 to 4, b is a number of from 0 to 3, c is a number of from 1 to 3, n is 2, 3 or 4, and r is a number of from 1 to 50.

4,511,728

SILANES AND COMPOSITIONS PREPARED THEREFROM

Franz-Heinrich Kreuzer, Martinsried; Gisela Glauberman, Munich, and Erhard Bosch, Burghausen, all of Fed. Rep. of Germany, assignors to Consortium für Elektrochemische, Munich, Fed. Rep. of Germany

Filed Dec. 30, 1982, Ser. No. 454,810

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210337

Int. Cl.³ C07F *7/08, 7/10, 7/18*

U.S. Cl. 556—419 **4 Claims**

1. Silanes of the formula $R_nSi(OCR_2^1COZR)_{4-n}$ and oligomers thereof; wherein R is selected from the group consisting of monovalent hydrocarbon radicals and substituted monovalent hydrocarbon radicals, R^1 is selected from the group consisting of hydrogen and R, Z is an

group, where R^1 is the same as above and n is 0 or 1.

4,511,729

NUCLEOPHILIC SUBSTITUTION PROCESS

G. Patrick Stahly, and Barbara C. Stahly, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 452,616, Dec. 23, 1982, , which is a continuation-in-part of Ser. No. 373,633, Apr. 30, 1982,. This application Mar. 10, 1983, Ser. No. 474,137

The portion of the term of this patent subsequent to Oct. 9, 2001, has been disclaimed.

Int. Cl.³ C07C *79/46*

U.S. Cl. 560—020 **17 Claims**

1. A process which comprises reacting a nitrophenoxy- or nitrophenylthiobenzene with an alpha,alpha-disubstituted acetic acid ester in an inert solvent and in the presence of a base so as to form a nitrophenoxy- or nitrophenylthiobenzeneacetic acid ester.

4,511,730

CARBAMATES OF BETA-HYDROXYETHYLSULFOXIDES

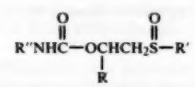
Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 17, 1982, Ser. No. 408,763

Int. Cl.³ C07C *125/063*

U.S. Cl. 560—033 **5 Claims**

1. Carbamates of beta-hydroxyethylsulfoxides of the structural formula



wherein R, R′ and R″ are individually selected from the group consisting of radicals derived from benzene, biphenyl, naphthalene, anthracene, and phenanthrene; alkyl moieties of 1 to 22 carbon atoms; and aralkyl moieties, alkylated aryl moieties and cycloalkyl moieties containing 4 to 40 carbon atoms, the ring radicals of said moieties being selected from the group consisting of phenyl, biphenyl, and cyclohexyl radicals wherein R′ can be substituted with nitro, halogen, cyano and carboalkoxy moieties of 1 to 12 carbon atoms.

4,511,731

2-ETHOXYETHYL 2-(4-HYDROXYPHENOXY)-PROPANOATE

Abel Mendoza, and Eric W. Otterbacher, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 24, 1983, Ser. No. 507,448

Int. Cl.³ C07C *69/612*

U.S. Cl. 560—061 **1 Claim**

1. 2-Ethoxyethyl 2-(4-hydroxyphenoxy)propanoate.

4,511,732

LOW VISCOSITY UV CURABLE POLYACRYLATES

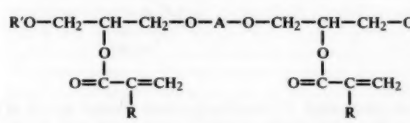
Darrell D. Hicks, Jeffersontown, Ky., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 357,960, Mar. 15, 1982, abandoned. This application Apr. 25, 1983, Ser. No. 488,317

Int. Cl.³ C07C *69/54, 69/347, 69/767*

U.S. Cl. 560—221 **7 Claims**

1. A photocurable, relatively low viscosity, liquid monomer having the formula



wherein R is hydrogen or methyl, R′ is C_1–C_8 alkyl or C_3–C_8 alkyl ether alkyl, and A is the aromatic or aliphatic residue of a diol or the diacyl aliphatic or aromatic residue of a dicarboxylic acid.

4,511,733

FLUORINE-CONTAINING AMINOCARBOXYLIC ACID COMPOUNDS

Iwao Hisamoto, Suita; Chiaki Maeda, Kyoto, and Masaru Hirai, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

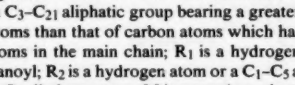
Filed Dec. 23, 1982, Ser. No. 452,811

Claims priority, application Japan, Dec. 25, 1981, 56-210363

Int. Cl.³ C07C *101/30*

U.S. Cl. 560—253 **6 Claims**

1. A fluorine-containing aminocarboxylic acid compound of the formula:



wherein Rf is a C_3–C_{21} fluorine-containing aliphatic group bearing a greater number of fluorine atoms than that of carbon atoms or a C_3–C_{21} aliphatic group bearing a greater number of fluorine atoms than that of carbon atoms which has up to four oxygen atoms in the main chain; R_1 is a hydrogen atom or a C_1–C_3 alkanoyl; R_2 is a hydrogen atom or a C_1–C_5 alkyl group; R_3 is a C_1–C_3 alkylene group; M is a member selected from the group consisting of a proton, an alkali metal ion, an ammonium ion, $NH_3(CH_2)_2OH$, $NH_2(CH_3)_2$, and $NH(C_2H_5)_3$; and n is an integer of 1 to 5, said compound being useful as a surface tension lowering agent for water and/or organic liquids.

4,511,734

PROCESS FOR THE PRODUCTION OF 3,3-DIMETHYLGLUTARIC

Pavel Lehky, Naters, and Peter Hardt, Visp, both of Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Filed May 5, 1982, Ser. No. 375,343

Claims priority, application Switzerland, May 12, 1981, 3061/81

Int. Cl.³ C07C *51/285, 51/34, 55/02*

U.S. Cl. 562—524 **10 Claims**

1. Process for the production of 3,3-dimethylglutaric acid from isophorone which comprises converting isophorone with ozone at a temperature of −20° to +20° C. in the presence of water or a solvent to an ozone-addition product, converting the ozone-addition product by hydrolysis in the presence or absence of a solvent into 3,3-dimethyl-5-oxo-hexanoic acid and converting the 3,3-dimethyl-5-oxo-hexanoic acid by treatment with hydrogen peroxide at a temperature of 15° to 70° C. into 3,3-dimethylglutaric acid.

4,511,735

PARTICULATE FUNGICIDES

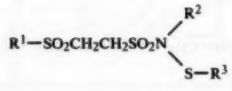
Philip S. Magee, Vallejo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 30, 1983, Ser. No. 537,753

Int. Cl.³ C07C *143/74, 143/76, 143/78*

U.S. Cl. 514—601 **21 Claims**

1. A compound of the formula:



wherein

R^1 is lower alkyl, lower alkenyl, lower alkynyl or aryl of 6 to 10 carbon atoms optionally substituted with up to 3 halogen atoms;

R^2 is lower alkyl, lower alkenyl, lower alkynyl or aryl of 6 to 10 carbon atoms optionally substituted with up to 3 halogen atoms or up to 3 lower alkoxy groups; and

R^3 is alkyl of 1 to 3 carbon atoms substituted with 3 to 6 halogen atoms or trihalovinyl.

4,511,736

PROCESS FOR THE PREPARATION OF SUBSTITUTED CHLOROACETANILIDES

Ferenc Mogyoródi; Eniko Koppány; Tibor Bódi; Károly Balogh, all of Miskolc; István Tóth, Sajóbábony; Rezso Bognár, Debrecen; Sándor Makleit, Debrecen; György Litkei, Debrecen; Miklós Rákosi, Debrecen, and Zoltán Dinya, Debrecen, all of Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajóbábony, Hungary

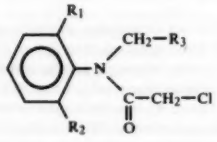
Filed Jan. 7, 1983, Ser. No. 456,383

Claims priority, application Hungary, Jan. 15, 1982, 103/82

Int. Cl.³ C07C *102/00, 102/06*

U.S. Cl. 564—214 **10 Claims**

1. A process for the preparation of a substituted chloroacetanilide of the formula

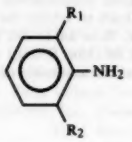


(I)

wherein:

R_1 and R_2 represent independently from each other a hydrogen atom or a C_{1-8} alkyl or C_{1-8} alkoxy group; and

R_3 is a straight chain or branched C_{1-8} alkoxy group comprising the steps of chloroacetylating an aniline of the formula



(II)

at a temperature of 10° to 120° C., optionally in a solvent medium in the presence of an acid binding agent, then reacting a thus-obtained intermediate with chloromethyl chloroformiate or, alternatively, reacting a compound of the formula (II) first with chloromethyl chloroformiate and subjecting the product to chloroacetylation, thereafter reacting a thus-obtained intermediate with an alcohol of the formula

$$R_3—H \qquad \text{(III)}$$

optionally in a solvent medium in the presence of an acid binding agent, and recovering a product of the formula (I).

4,511,737

BICYCLO(2.2.1)HEPTANE OXIMES

Zoltán Budai; Attila Kis-Tamás; Tibor Mezei; Aranka Lay; Zoltán Vigh, and Ágnes Sokorai, all of Budapest, Hungary, assignors to EGYT Gyógyszervegyészeti Gyár, Budapest, Hungary

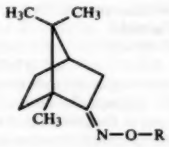
Division of Ser. No. 322,675, Nov. 18, 1981, Pat. No. 4,425,158. This application Nov. 15, 1983, Ser. No. 551,941

Claims priority, application Hungary, Nov. 21, 1980, 2774/80

Int. Cl.³ C07C *131/02*

U.S. Cl. 564—257 **3 Claims**

1. Racemic or optically active compounds of the formula (I)



(I)

wherein

R represents a C_{3-12} alkyl group optionally substituted by a lower alkoxy group, a C_{2-4} alkenyl group or a phenyl-(lower alkyl) group substituted on the phenyl ring by one or more lower alkoxy groups or halogen atoms.

4,511,738

PROCESS FOR PREPARING PHOSPHINE OXIDES

Kanji Tokuyama; Yasuhiro Nishitani; Mamoru Tanaka, all of Osaka, and Wataru Nagata, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jan. 7, 1983, Ser. No. 456,221

Claims priority, application Japan, Jan. 12, 1982, 57/3718

Int. Cl.³ C07F *9/54*

U.S. Cl. 568—14 **15 Claims**

1. A process for preparing a tri-(monocyclic aryl)phosphine oxide or a tri-lower alkyl phosphate which comprises:

chlorinating the corresponding tri-(monocyclic aryl)phosphine sulfide or tri-lower alkyl thionophosphate by treatment with a hypohalite salt or chlorine in an aqueous medium; and

hydrolyzing by treatment with an aqueous base.

4,511,739
CONTINUOUS PREPARATION OF GLYOXAL

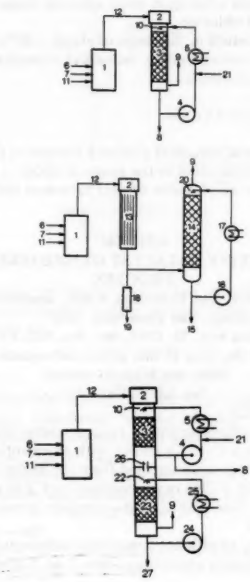
Wolfgang Sauer, Mannheim, and Wolfgang Hoffmann, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 27, 1980, Ser. No. 153,704

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922599

Int. Cl.³ C07C *47/127*

U.S. Cl. 568—473 **17 Claims**



1. A process for the continuous preparation of glyoxal by oxidizing glycol with an oxidizing agent in the presence of a silver catalyst at elevated temperature, cooling the hot reaction gases and separating off the end product, wherein all or part of the glyoxal, glycol and/or glycol aldehyde, together with water are condensed out of the hot stream of the reaction mixture, which is in vapor form and at from 450° to 800° C., after the oxidation and not more than one second after the gases have issued from the catalyst, by means of water or aqueous glyoxal solution at from 0° to 130° C. and in the form of droplets having a mean diameter of from 1 to 2,000 micrometers, the majority of the droplets impinging on the stream of reaction gases at an angle of from 2° to 85° to the axis of the stream.

4,511,740
PROCESS FOR HYDROFORMYLATION OF TERMINAL OLEFINS TO PREDOMINANTLY LINEAR ALDEHYDES

David C. Alexander, and John F. Knifton, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,696

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 **17 Claims**

1. A process for preparing predominantly linear aldehydes containing from 3 to 21 carbon atoms which comprises the steps of

contacting straight chain terminal olefins, with 2 to 20 carbons, carbon monoxide and hydrogen with a catalyst system comprising a ruthenium-containing compound and optionally a cobalt-containing compound mixed with an insoluble polymeric phosphonium salt of the formula:

$$P-(CH_2)_nPR_3^+X^-$$

where

P is an insoluble polymeric framework selected from the group of polymers consisting of polystyrene crosslinked with divinylbenzene, polyethylene and polymethyacrylamide,

R is one or more alkyl or aryl radicals each containing one to twenty carbon atoms,

x is halogen or an acetate grouping,

n is 0→3,

heating resultant reaction mixture under a pressure of 200 psi or greater at a temperature of at least 100° C. and isolating said linear aldehydes.

4,511,741
PRODUCTION OF ALDEHYDES FROM ORGANIC ACID ESTERS

Richard W. Wegman, South Charleston, and David C. Busby, Cross Lanes, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 2, 1983, Ser. No. 557,269

Int. Cl.³ C07C *45/49, 45/50*

U.S. Cl. 568—484 **18 Claims**

1. A process for the reaction of an organic ester having the structural formula RCOOR' or R'OOCR"COOR' in which R and R' are monovalent hydrocarbyl (i) alkyl groups having from 1 to 30 carbon atoms, (ii) alkenyl groups having from 2 to 30 carbon atoms, or (iii) aryl, aralkyl or alkaryl groups having from 6 to 10 ring carbon atoms and from 1 to 10 carbon atoms in the alk-moiety thereof, and R" is a divalent hydrocarbyl group as defined for R and R' having from 2 to 10 carbon atoms, and wherein R can also be hydrogen, with carbon monoxide or synthesis gas to selectively produce an aldehyde, said process conducted at a temperature of from 100° C. to 300° C., a pressure of from 500 psig to 10,000 psig, wherein said synthesis gas has a H_2:CO mole ratio of from 1:10 to 10:1, in contact with a mixed cobalt and rhodium homogenous catalyst system containing lithium iodide or lithium bromide as the promoter, wherein the mole ratios of Li:Co and Li:Rh are from 50:1 to 1:50, the Li:Co:Rh mole ratio is from 50:1:1 to 1:50:50 and the Rh:Co ratio is from 10:1 to 1:10.

4,511,742
EXTRACTION OF OLIGOMERS FROM POLYMERS OF EPIHALOHYDRIN

Simon H. Yu, Parma, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 30, 1982, Ser. No. 412,474

Int. Cl.³ C07C *43/11, 43/18, 43/20*

U.S. Cl. 568—614 **10 Claims**

1. Method for extracting cyclic oligomers of an epihalohydrin selected from dimers, trimers, tetramers, pentamers, hexamers, heptamers, and the like, from a functionally terminated liquid polyether containing same comprising contacting said polyether with a solvent in which said oligomers are soluble but in which said polyether is substantially insoluble, and separating said solvent from said polyether whereby at least 75% of said oligomers are extracted from said polyether by said solvent, said polyether is selected from homopolymers of an epihalohydrin, copolymers of an epihalohydrin with a cyclic ether monomer containing 2 to 10 carbon atoms, and block copolymers of an epihalohydrin, said copolymers containing 1 to 99 weight percent epihalohydrin in polymerized form.

4,511,743

PROCESS FOR HOMOLOGATING ALCOHOLS THROUGH THE INTERMEDIATE PRODUCTION OF KETALS WITH COBALT CARBONYL COMPLEXES AS CATALYSTS

Claude Seite, Creteil; Dominique Commereuc, Meudon, and Yves Chauvin, Le Pecq, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 4, 1983, Ser. No. 548,737
Claims priority, application France, May 11, 1982, 82 18737
Int. Cl.³ C07C 27/20
U.S. Cl. 568—814 16 Claims

1. A process for converting an alcohol to the acetal of its next higher homolog aldehyde, comprising the steps of reacting the alcohol with a ketone, or a ketal thereof with a less reactive alcohol, under conditions wherein the alcohol is converted to its corresponding ketal; contacting the resultant ketal with synthesis gas comprising carbon monoxide and hydrogen, in the presence of an effective catalytic amount of a cobalt carbonyl complex; and recovering resultant acetal of the next higher homolog aldehyde of said alcohol.

4,511,744

PROCESS FOR PRODUCING LOWER ALKYLENE GLYCOL, CATALYST COMPOSITION USED THEREFOR AND PROCESS FOR PRODUCTION THEREOF

Haruhiko Miyazaki; Koichi Hirai; Taizo Uda; Yasuo Nakamura, all of Ube; Harumi Ikezawa, Onoda, and Takanori Tsuchie, Ube, all of Japan, assignors to UISE Industries, Ltd., Yamaguchi, Japan

Filed May 5, 1983, Ser. No. 491,742
Claims priority, application Japan, May 6, 1982, 57-74611
Int. Cl.³ C07C 29/136, 31/20
U.S. Cl. 568—864 14 Claims

1. A process for producing a lower alkylene glycol, which comprises hydrogenating a lower alkyl ester of a lower hydroxycarboxylic acid in the vapor phase at an elevated temperature in the presence of a hydrogenation catalyst composition composed of a reduction product of copper-containing silica gel formed by contacting an ammine complex of copper with silica gel having an average particle diameter of not more than 200 microns or colloidal silica sol.

4,511,745

PROCESS FOR FUNCTIONALIZING ALKANES

Robert G. Bergman, Kensington, Calif.; Andrew H. Janowicz, Wilmington, Del., and Roy A. Periana-Pillai, Berkeley, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 12, 1984, Ser. No. 619,886
Int. Cl.³ B01J 19/12; C07C 17/00; C07F 15/00
U.S. Cl. 570—241 11 Claims

1. A process for functionalizing saturated hydrocarbons comprising:

(a) reacting said saturated hydrocarbons of the formula:

RH

where:
H represents a hydrogen atom, and
R represents a saturated hydrocarbon radical,
with a metal complex of the formula:

$CpRhPMe_3H_2$

where:
Cp represents a pentamethylated cyclopentadienyl radical,
Rh represents a rhodium atom,
P represents a phosphorous atom,
Me represents a methyl group,
H represents a hydrogen atom,

in the presence of ultraviolet radiation at a temperature maintained at about −60° to −17° C. to form a hydridoalkyl complex of the formula:

$CpRhPMe_3(R)(H)$

(b) reacting said hydridoalkyl complex with a haloform of the formula:

CHX_3

where:
X represents a halogen atom selected from bromine, iodine and chlorine,
at a temperature in the range of about −60° to −17° C. to form the corresponding haloalkyl complex of step (a) having the formula:

$CpRhPMe_3(R)(X)$; and,

(c) reacting said haloalkyl complex formed in (b) with halogen at a temperature in the range of about −60° to 25° C. to form the alkyl halide of said saturated hydrocarbon.

4,511,746

LOW ACTIVITY CATALYST OLIGOMERIZATION PROCESS

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 25, 1981, Ser. No. 305,803
The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.
Int. Cl.³ C07C 2/02
U.S. Cl. 585—323 7 Claims

1. An alkene oligomerization process comprising:

(a) contacting a C_2 to C_6 alkene with an essentially alumina-free molecular sieve selected from the group consisting of silicalite, RE 29,948 organosilicate, or CZM at a temperature of less than 350° C. and a pressure greater than about 40 bar; and

(b) recovering an effluent comprising substantial amounts of olefin multimers containing from 2 to 5 units of said alkene.

4,511,747

LIGHT OLEFIN CONVERSION TO HEAVIER HYDROCARBONS WITH SORPTION RECOVERY OF UNREACTED OLEFIN VAPOR

Bernard S. Wright, East Windsor; Chung H. Hsia, Matawan, and Hartley Owen, Belle Mead, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 1, 1984, Ser. No. 576,179
Int. Cl.³ C07C 3/02, 3/03, 3/20
U.S. Cl. 585—415 8 Claims

1. A continuous process for converting ethene-rich olefinic feedstock to heavier liquid hydrocarbons comprising the steps of

combining the feedstock stream with a liquid hydrocarbon stream containing a major amount of gasoline range hydrocarbons including C_5^+ olefins;

contacting the combined feedstock-gasoline stream at elevated temperature and pressure in a reaction zone with the shape selective medium pore zeolite oligomerization catalyst to convert at least a portion of the olefinic components to heavier hydrocarbons;

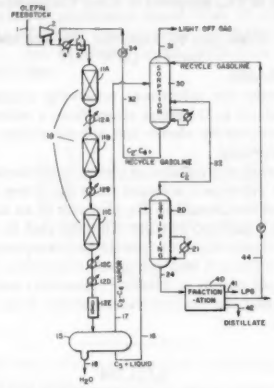
cooling oligomerization reaction effluent to condense at least a portion of said heavier hydrocarbons;

separating the cooled and partially condensed effluent stream into an ethene-rich vapor stream and condensed liquid hydrocarbon stream;

fractionating said condensed hydrocarbons to provide a gasoline stream, a distillate product stream and a light hydrocarbon vapor stream containing unreacted ethene;

contacting the ethene-rich vapor from the separation step

and the light hydrocarbon vapor stream under sorption pressure conditions with a cooled liquid portion of the gasoline hydrocarbon to sorb ethene into the liquid gasoline stream; and pressurizing and recycling the sorbed ethene and gasoline stream for combining with an ethene-rich feedstock.



4,511,748

PROCESS FOR PRODUCING ALKYLBENZENES

Michio Kudoh, Yohohama; Mitsuo Matsuno, Kawasaki, and Hirosuke Imai, Yohohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed May 23, 1984, Ser. No. 613,211

Claims priority, application Japan, May 31, 1983, 58-96756

Int. Cl.³ C07C *3/52*

U.S. Cl. 585—467 **6 Claims**

1. A process for the production of alkylbenzenes which comprises alkylating an aromatic hydrocarbon containing a side-chain in which at least one hydrogen atoms is bonded to a carbon atom alpha to the nucleus with an olefin in the presence of a catalyst comprising sodium and/or sodium amide deposited on a carrier of the formula

$$K_2O.xAl_2O_3$$

where x is $0.5 \leqq x \leqq 11$.

4,511,749

CONVERSION OF METHANOL TO TOLUENE USING AMORPHOUS SILICA-ALUMINA CATALYSTS

Joseph G. Robinson, Winchcombe, and Pierce W. F. Riemer, Huntly, both of England, assignors to Coal Industry Patents Limited, London, England

Filed Nov. 22, 1983, Ser. No. 554,244

Claims priority, application United Kingdom, Feb. 11, 1983, 8303772

Int. Cl.³ C07C *1/20*

U.S. Cl. 585—469 **7 Claims**

1. A process for the production of toluene with high selectivity, comprising passing methanol with at least an equal weight of water over a silica-alumina catalyst which comprises a highly porous amorphous silica xerogel having a layer of an aluminum compound chemically bonded onto the surface in an amount equivalent to a monolayer on up to 90% of the BET surface area of the silica xerogel, said catalyst having a maximum pore diameter of about 1.1 nm, having substantially only protons as electrical charge balancing species on the surface of the layer, the reaction causing bonding of the layer having been carried out at a temperature of from 300° to 600° C. and the catalyst having been calcined at a temperature not exceeding 600° C., at a process reaction temperature in the range 280° to 600° C.

4,511,750

OLEFIN OLIGOMERIZATION WITH AN ACTIVATED CATALYST

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 416,790, Sep. 10, 1982, Pat. No. 4,465,788. This application Jun. 14, 1984, Ser. No. 620,594

Int. Cl.³ C07C *3/14*

U.S. Cl. 585—526 **7 Claims**

1. A process for oligomerizing a lower olefin in a lower olefin feed comprising: contacting said feed with a catalyst including nickel sulfate associated with a porous, inorganic oxide at oligomerization conditions, said catalyst having been activated by

(a) contacting said catalyst with a gas containing free oxygen at a temperature in the range from about 750° F. to about 1150° F. for at least 2 hours; and

(b) contacting the resulting catalyst with an inert gas at a temperature of about 350° F. to about 750° F. for at least 1 hour.

4,511,751

PROCESS FOR PRODUCING ISOPRENE

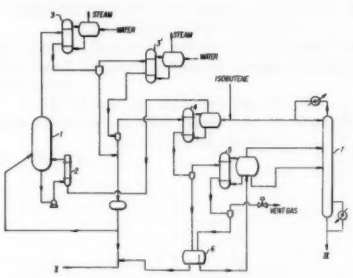
Yoichi Ninagawa; Osamu Yamada; Tsumoru Renge, all of Hasaki; Sunao Kyo, Abiko; Takayoshi Osaki, Kurashiki, and Koichi Kushida, Ibaraki, all of Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Oct. 11, 1983, Ser. No. 540,870

Claims priority, application Japan, Oct. 14, 1982, 57-180759; Dec. 9, 1982, 57-216500; Dec. 13, 1982, 57-219096; Dec. 24, 1982, 57-229192; Apr. 4, 1983, 58-59654; Apr. 13, 1983, 58-66147; May 20, 1983, 58-89827; Jun. 20, 1983, 58-111485

Int. Cl.³ C07C *11/18*

U.S. Cl. 585—608 **13 Claims**



1. A process for producing isoprene by reacting isobutene and/or tertiary butanol with formaldehyde in an acidic aqueous solution, characterized in:

(a) that the acidic aqueous solution is present in the reaction zone,

(b) that isobutene and/or tertiary butanol, a formaldehyde source and water are fed to said reaction zone continuously or intermittently, and

(c) that isoprene, water, unreacted starting materials and other low-boiling components are distilled off from said reaction zone,

the amounts of said isobutene and/or tertiary butanol and formaldehyde source being fed to said reaction zone being such that the isobutene/tertiary butanol-to-formaldehyde molar ratio in the charge is at least 3 and the pressure in the reaction system being maintained at a level 1.1 to 2.5 times the vapor pressure at the reaction temperature of the acidic aque-

ous solution existing in the reaction zone, said isobutene/tertiary butanol-to-formaldehyde molar ratio being calculated by calculating the amount of the formaldehyde source in formaldehyde equivalent when said source is other than formaldehyde.

4,511,752

PROCESS FOR THE HYDROISOMERIZATION OF PARAFFINS

Jacobus J. L. Heinerman, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 20, 1983, Ser. No. 486,773

Claims priority, application Netherlands, Apr. 26, 1982, 8201716

Int. Cl.³ C07C *5/13*

U.S. Cl. 585—739 **8 Claims**

1. A process for the hydroisomerization of paraffin hydrocarbons in the presence of hydrogen under suitable reaction conditions, wherein the catalyst used therein is a catalytically active metal silicate comprising an at least partly crystalline metal silicate having a crystal lattice which consists substantially of a triplex layer structure containing in the central layer octahedrally coordinated aluminum which may be entirely or partly substituted by one or more metals from Group VIII of the Periodic Table of Elements, and in the two outer layers tetrahedrally coordinated silicon which may be entirely or partly substituted by aluminum, and wherein said metal silicate is treated by contact with one or more compounds comprising chlorine which can further release one or more protons and/or hydrogen chloride.

4,511,753

SELECTIVE REMOVAL OF VINYLIDENE OLEFIN FROM OLEFIN MIXTURES

R. Scott Smith, Baton Rouge, and Gerald Z. Smith, Jr., Francisville, both of La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jan. 16, 1984, Ser. No. 570,934

Int. Cl.³ C07C *7/17*

U.S. Cl. 585—856 **33 Claims**

1. A process for selectively removing vinylidene olefins containing about 6–22 carbon atoms from a mixture of olefins containing vinylidene olefins and non-vinylidene olefins, said process comprising

(a) contacting said mixture of olefins in the liquid phase with a sulfur compound selected from the group consisting of H_2S and mercaptans in the presence of an acidic catalyst to form a sulfided mixture whereby said H_2S selectively converts said vinylidene olefins to mercaptans, sulfides, or mixtures thereof, said mercaptan selectively converts said vinylidene olefins to a sulfide (thioether) and

(b) separating said non-vinylidene olefins from said sulfided mixture.

4,511,754

HYDROCARBON DEHYDROGENATION

Anne M. Gaffney, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 16, 1984, Ser. No. 600,652

Int. Cl.³ C07C *5/32*

U.S. Cl. 585—656 **22 Claims**

1. A method for dehydrogenating dehydrogenatable hydrocarbons which comprises contacting at a temperature within the range of about 500°–1000° C. a gas comprising said hydrocarbon and a solid comprising:

(a) a reducible oxide of Tb and

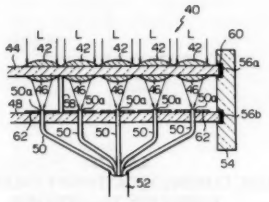
(b) at least one member of the group consisting of alkali metals, alkaline earth metals, and compounds thereof.

ELECTRICAL

4,511,755
SOLAR RAY COLLECTION APPARATUS

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed May 9, 1983, Ser. No. 493,095
Claims priority, application Japan, May 17, 1982, 57-81477; Jun. 3, 1982, 57-95969; Dec. 31, 1982, 57-230792
Int. Cl.³ H01L *31/04*; G02B *5/14*
U.S. Cl. 136—246 24 Claims

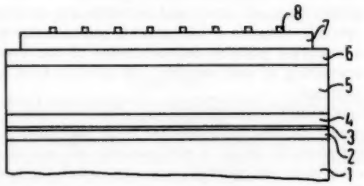


1. A solar ray collection apparatus comprising:
a plurality of lenses;
a first transparent flat support member for supporting the lenses on a surface thereof;
a plurality of light conducting members equal in number to the lenses; and
a second transparent flat support member integrally connected to the first support member in a predetermined spaced parallel position, said lenses and said first and second support members having substantially the same coefficient of thermal expansion, said second support member supporting the light conducting members in such positions that one end of each of the light conducting members faces one of the lenses associated therewith and coincides with a focal point of said one lens.

4,511,756
AMORPHOUS SILICON SOLAR CELLS AND A METHOD OF PRODUCING THE SAME

Matthias Moeller, and Helmold Kausche, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 16, 1983, Ser. No. 523,609
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3242831
Int. Cl.³ H01L *31/06, 31/18*
U.S. Cl. 136—258 6 Claims



1. In a solar cell having a semiconductor body composed essentially of amorphous silicon applied to a substrate having at least one surface thereof comprised of a metal layer functioning as a back contact, the improvement which comprises employing as said metal layer one which is composed of aluminum and which further comprises a diffusion barrier layer composed of titanium nitride positioned between said metal layer and said semiconductor body.

4,511,757
CIRCUIT BOARD FABRICATION LEADING TO INCREASED CAPACITY

Jose A. Ors, Solebury Township, Bucks County, Pa., and Richard D. Small, Jr., West Windsor Township, Mercer County, N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

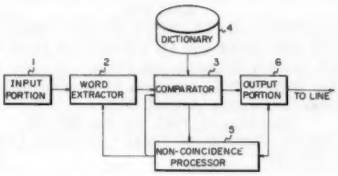
Filed Jul. 13, 1983, Ser. No. 513,485
Int. Cl.³ H05K *1/03*
U.S. Cl. 174—68.5 6 Claims

1. A product comprising a first and second pattern of conductive material, an electrically insulating material interposed between said first and second pattern and an electrical connection between said first and second pattern through said insulating material by a conductive via wherein said conductive via and said insulating material is formed by subjecting an energy-sensitive material to electromagnetic radiation processing to form said via and to produce said insulating material wherein said energy-sensitive material comprises a mixture of an acrylated rubber modified epoxy polymer wherein the rubber is in the backbone of the epoxy polymer and is derived from reacting an epoxy resin with a carboxy terminated butadiene-acrylonitril based rubber, an acrylated epoxy having a glass transition temperature of at least 50° C. that is compatible with said acrylated rubber modified epoxy and a viscosity modifier.

4,511,758
REDUCTION OF MESSAGE LENGTH IN A COMMUNICATION SYSTEM

Kazunori Konishi, Kawasaki, and Akira Kurematsu, Yokohama, both of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1983, Ser. No. 486,917
Claims priority, application Japan, Apr. 22, 1982, 57-66369
Int. Cl.³ H04L *3/00*
U.S. Cl. 178—2 B 5 Claims

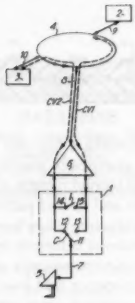


1. A message communication process between a transmission side and a reception side comprising the steps of:
at the transmission side, comparing for all of the characters in a message, a character string of the message to be transmitted with a dictionary, and encoding all of said character string into a variable length compact code according to the content of the dictionary,
sending the encoded compact code to the reception side,
at the reception side, decoding the encoded compact code with a dictionary having the same content as the dictionary of the transmission side,
wherein said dictionary is an electronically controlled dictionary with a memory.

4,511,759
APPARATUS FOR CONTROLLING TRANSFERS OF FILES BETWEEN COMPUTERS

Jean-Paul Irlande, 4 Allée Bourvil, 94000 Rethel, France

Filed Aug. 4, 1983, Ser. No. 520,218
Claims priority, application France, Aug. 13, 1982, 82 14083
Int. Cl.³ H04L *13/10*
U.S. Cl. 178—2 R **4 Claims**

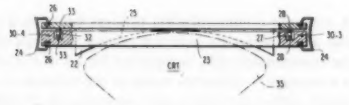


1. An apparatus for controlling the transfer of data between computers, connected to a communications network, accessible to at least one terminal by means of an asynchronous concentrator, which is connected between the network and an input-output junction of the terminal, comprising means connected between the input-output junction of the terminal and the concentrator, in order to asynchronously establish via the concentrator, a first virtual circuit between the terminal and a first computer of the network, then a second virtual circuit between the terminal and a second computer of the network, and connecting means for connecting the thus established virtual circuits, the transfers of files between the first and second computers then taking place across these connecting means, wherein the means for establishing the first and second circuits comprise at least one two-position switch having a common terminal member connected to the input-output junction of the terminal and two switching terminal members connected to the concentrator and corresponding to the two positions of the switch, the latter making it possible to establish the first and second virtual circuits.

4,511,760
FORCE SENSING DATA INPUT DEVICE RESPONDING TO THE RELEASE OF PRESSURE FORCE

Richard L. Garwin, Scarsdale, and James L. Levine, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 23, 1983, Ser. No. 497,290
Int. Cl.³ G08C *21/00*; G01G *3/14*; H04N *1/00*
U.S. Cl. 178—18 **30 Claims**



29. In a force sensitive input device for translating the location of a localized data input force applied to an essentially planar area member into data for machine computation, wherein said planar area member is supported with respect to a reference at at least three points by separate force sensors,

the improvement comprising in combination

means for establishing a sum of the output signals from each of said force sensors,

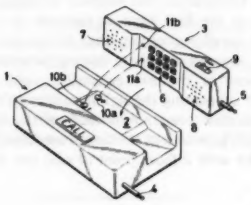
means for detecting a peak value of said sum in a polarity corresponding to a release of said data input force, and

means for determining a position of application of said data input force in accordance with a value of an output signal from each said force sensor at a time of detection of said peak value.

4,511,761
AUTOMATIC COMMUNICATION STANDBY DEVICE IN CORDLESS TELEPHONE

Kenji Yamazaki, Chiba, and Kazuo Maeda, Tokyo, both of Japan, assignors to Uniden Corporation of Japan, Ichikawa, Japan

Filed Jun. 17, 1982, Ser. No. 389,501
Claims priority, application Japan, Apr. 9, 1982, 57-58198
Int. Cl.³ H04M *1/02*; H04B *1/40*
U.S. Cl. 179—2 EA **20 Claims**



4. In a cordless telephone system including a base unit, and a portable unit having a transmission circuit and a reception circuit incorporated therein, said base and portable units being in communication with each other via radio waves, said base unit being provided with electric charge output terminals and said portable unit being provided with electric charge input terminals, and said charge output and input terminals being so adapted that when said portable unit is disposed upon a cradle of said base unit, said output and input terminals are brought into contact so as to charge a battery disposed inside said portable unit, the improvement comprising:

a switch disposed upon said portable unit and manually operable between a first service position and a second non-service position independently of the cradling or uncradling of said portable unit upon or from said base unit; and

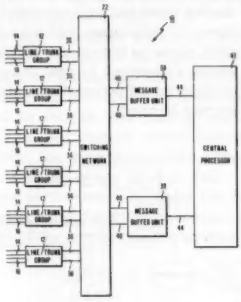
an electrically actuated switching element disposed within a power supply line extending from said battery to said transmission circuit of said portable unit and electrically coupled to said manually operated switch and said charge input terminals of said portable unit such that when said manually operated switch is disposed within said first service position, said switching element will assume an OPEN state in response to the existence of charge potential upon said electric charge input terminals of said portable unit as a result of the mating of said terminals of said portable and base units when said portable unit is disposed upon said cradle of said base unit so as to charge said battery of said portable unit, whereby said transmission circuit of said portable unit is rendered inoperative.

4,511,762

OVERLOAD DETECTION AND CONTROL SYSTEM FOR A TELECOMMUNICATIONS EXCHANGE

Robert Stockdale, West Palm Beach, Fla., assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Jun. 6, 1983, Ser. No. 501,940
Int. Cl.[3] H04M *15/10, 3/28*
U.S. Cl. 179—9 25 Claims



1. Apparatus for a telecommunications exchange, comprising:

(a) central processing means for controlling certain operations of said telecommunications exchange;

(b) at least one line/trunk group connected to said central processing means, said line/trunk group comprising,

(1) a plurality of telecommunication trunks for receiving and transmitting telecommunication signals;

(c) a switching means connected to said central processing means and to said line/trunk group enabling said telecommunication trunks to communicate with each other, said switching means comprising,

(1) means associated with said line/trunk group for sending a message to said central processing means whenever one of said telecommunication trunks is to communicate with another one thereof; and

(2) means associated with said central processing means for receiving said message and sending a responsive message to said line/trunk group;

wherein said line/trunk group further comprises system overload detection means comprising,

(1) means associated with said line/trunk group to measure the time for said central processing means to send said responsive message to said line/trunk group in response to said message sent by said line/trunk group to said central processing means; and

(2) means responsive to said time for determining the system overload condition.

4,511,763

FLOATING DC CURRENT SOURCE FOR A SUBSCRIBER LOOP CIRCUIT

Constatine V. Skidanenko, Menlo Park, and Gregor D. McGibbon, San Carlos, both of Calif., assignors to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Nov. 1, 1982, Ser. No. 437,936
Int. Cl.[3] H04M *19/00*
U.S. Cl. 179—16 AA 3 Claims

1. In floating battery feed circuit, apparatus for providing a controlled subscriber loop current comrising:

a primary dc source having positive and negative output terminals, said positive output terminal being connected to ground;

a transformer having only a primary and a secondary winding and no sense winding, a first terminal of said primary winding being connected to said negative output terminal of said primary dc power source;

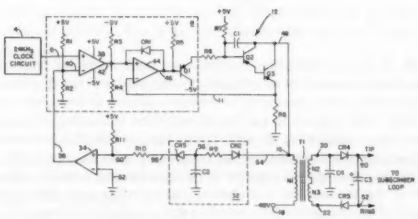
a rectifier circuit connected between the first and second output terminals of said secondary winding, the output of said rectifier circuit being adapted for connection to the tip and ring leads of the subscriber loop;

a clock source providing an output pulse at predetermined time intervals;

a pulse width voltage converter means obtaining power from said primary dc source and being responsive to a clock pulse for enabling the passage of direct current from said primary source throgh said primary winding, said converter means including feedback control means providing an indication of the magnitude of said passing direct current; latch means causing said converter means to pass said direct current until it is disabled, which disablement occurs either at the trailing edge of said clock pulse if a feedback control indication from the associated means is below a predetermined value, or when the feedback control indication from the associated means reaches said predetermined value after termination of said clock pulse; and

means responsive to a reflected voltage from said secondary winding for immobilizing said converter means when the subscriber loop impedance exceeds a threshold value, whereby an on-hook high impedance condition is recognized, thus reducing power consumption during the idle circuit condition;

said converter means further comprising a first operational amplifier having a non-inverting input receiving the output pulse signals from said clock source and an inverting input electrically connected to an output of said immobilizating means, said inverting input being normally held at a fixed bias except during immobilizing intervals; and a second operational amplifier having a non-inverting input receiving a pulse output from said first operational amplifier, having said latch means which comprises a diode being connected between an output terminal and said non-inverting input of said second amplifier, said diode normally being forward biased but the presence of a clock pulse at said non-inverting input thereof causing it to be back biased and latched at least for the duration of said clock pulse; said second amplifier having an inverting input receiving the feedback control signal from said feedback control means and thereby holding said second operational amplifier latched if the feedback voltage applied to said inverting input thereof exceeds said predetermined value before said clock pulse terminates; and



said immobilizing means comprising a peak detector having an input connected to the other terminal of said primary winding and being responsive to the reflected voltage from said secondary winding which is enhanced by the turns ratio of said transformer, having an output and including means for storing said voltage; a breakdown diode having an input receiving the output voltage from said peak detector and being responsive to such voltages above it's breakdown voltage to provide an output voltage thereof; and a third operational amplifier having a non-inverting input connected to the output of said breakdown diode, said non-inverting input also having a fixed

reference voltage applied thereto which causes a high impedance output thereof except when the output voltage from said breakdown diode reaches a predetermined value in which event the output of said third operational amplifier becomes a negative voltage, thereby biasing said first operational amplifier so that it is non-responsive to said clock pulses, which reduces the power dissipation during on-hook conditions of the subscriber loop.

4,511,764

TELEPHONIC DISPLAY DEVICE

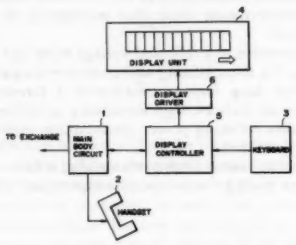
Yasunobu Nakayama, Musashino; Yasuji Sato, Hachiouji, and Takeshi Kunii, Fuchu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 27, 1982, Ser. No. 453,819

Claims priority, application Japan, Dec. 25, 1981, 56-209375

Int. Cl.³ H04M *1/26*

U.S. Cl. 179—90 AN **18 Claims**



10. A display telephone including a main body for transmitting dialing signals to an exchange, a display unit for displaying stored data, and a memory in which is stored at least one type of data with respect to parties to be called including character type data identifying a party to be called, telephone number type data representative of the telephone number of a party to be called, and special number type data having a smaller number of digits than the telephone number data and used as an index of stored telephone number data, said display telephone comprising;

a first function key used for displaying data stored in the memory and, if telephone number type data is stored in said memory, for calling a party corresponding to said telephone number type data; and

control means for searching the memory, when special number type data is inputted following the operation of said first function key, for a memory address corresponding to inputted special number type data and, if data of any type is stored at said address of the memory, for transferring said stored data into said display unit as well as, if telephone number type data is stored at said address of said memory, transferring said telephone number type data into the main body to call a party corresponding to said telephone number type data.

4,511,765

UNIVERSAL CONTROL DEVICE FOR RESTRICTING DIALING AND TIME LIMITING TELEPHONE CALLS

Calven Kuo, Taipei, Taiwan, assignor to Aurora Mechatronics Corporation, Taipei, Taiwan

Filed May 11, 1983, Ser. No. 493,591

Int. Cl.³ H04M *1/26, 1/66*

U.S. Cl. 179—90 BD **6 Claims**

1. A telephone control device for restricting dialing and time limiting telephone calls comprising:

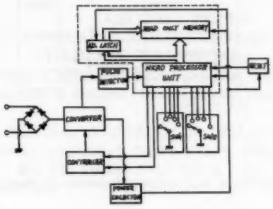
a full-wave rectifier adapted for connection to a telephone set for receiving a dialing signal and telephone power therefrom;

a converter circuit, connected to said full-wave rectifier, for (1) converting said dialing signal into a pulse, (2) converting said telephone power into power usable by the device, and (3) receiving a cut-off signal which cuts off use of the telephone set;

a pulse detector circuit, connected to said converter circuit, for receiving said pulse and generating a decoded signal;

a microprocessor, connected to said pulse detector circuit, for receiving said decoded signal and determining whether a predetermined period of time has elapsed since the beginning of the dialing signal or a predetermined number of dialing digits has been exceeded during dialing of the telephone set whereupon said microprocessor generates a control signal to cut off the telephone set;

first switch means, connected to said microprocessor for setting the predetermined period of time during which the telephone set may be used;



second switch means, connected to said microprocessor, for setting the predetermined number of digits which may be dialed from said telephone set;

memory means, connected to said microprocessor, for storing program instruction for said microprocessor;

an A/D latch circuit, connected to said microprocessor and to said memory means, for controlling the transfer of information from said memory means to said microprocessor;

a controller circuit for receiving said control signal from said microprocessor and generating said cut-off signal and transmitting it to said converter circuit; and

a power collector circuit, connected to said converter, for providing usable power to said microprocessor, said AD latch circuit, and said memory means.

4,511,766

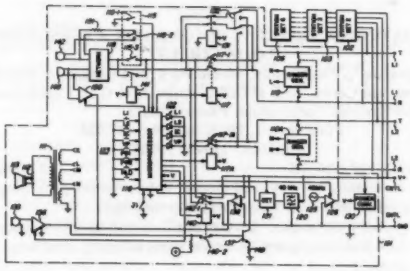
KEY TELEPHONE SYSTEM SIGNALLING AND CONTROL ARRANGEMENT

Mahesh Shah, Donelson, Tenn., assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 21, 1983, Ser. No. 487,298

Int. Cl.³ H04M *1/72*

U.S. Cl. 179—99 A **2 Claims**



1. In a key telephone system having a plurality of telephone

station sets for selective connection to first or second telephone lines;

a control unit comprising:

means for periodically transmitting a framing signal on a common control line to each of the station sets, the period between each framing signal being divided into a selected number of time slots;

one of the telephone station sets comprising means for transmitting an intercom signal in one of the time slots for indicating an intercom state; and

said one and at least one other telephone station set each comprising means responsive to the intercom signal for connecting their telephone handsets to the common control line; whereby an intercom state is established;

a transistor and an emitter load resistor network serially connected across the common control line in a normally conducting state; the impedance of the network approximating the impedance of the handset; and

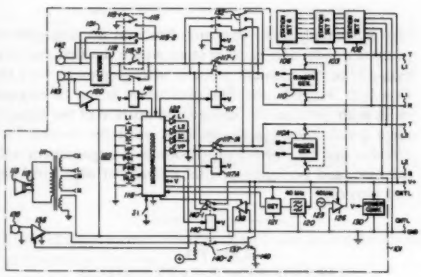
means responsive to the intercom signal for rendering the transistor non-conducting so as to compensate for the increased load of the handset on the control line.

4,511,767

KEY TELEPHONE SYSTEM SIGNALLING AND CONTROL ARRANGEMENT

David L. Wetzel, Charlottesville, Va., and Mahesh Shah, Donelson, Tenn., assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 21, 1983, Ser. No. 487,299
Int. Cl.³ H04M *1/72*
U.S. Cl. 179—99 A **6 Claims**



1. In a key telephone system having a plurality of telephone station sets for selective connection to first or second telephone lines;

a control unit comprising:

means for periodically transmitting a framing signal to each of the station sets on a common control line, the period between each framing signal being divided into a selected number of time slots;

means responsive to a voltage drop on one of the telephone lines resulting from one of the sets going off-hook for transmitting signals to the sets in selected ones of the time slots, indicating off-hook/on-hook status of the lines; and

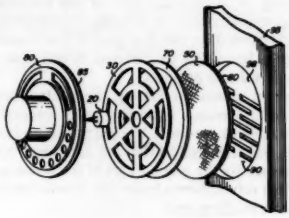
each of the telephone station sets comprising means responsive to the signals in the selected ones of the time slots for indicating the off-hook condition.

4,511,768

MOUNTING ARRANGEMENT FOR ALTERING A MICROPHONE'S FREQUENCY RESPONSE

Bakulesh B. Patel, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 29, 1982, Ser. No. 437,719
Int. Cl.³ H04M *1/04*
U.S. Cl. 179—146 R **17 Claims**



1. A microphone mounting arrangement for mechanically altering the audio frequency response characteristics of the microphone, comprising:

a loudspeaker having a cone;

a flexible diaphragm mechanically coupled to said cone so that said cone and said diaphragm substantially bound a resonant enclosure;

a microphone disposed within said enclosure; and

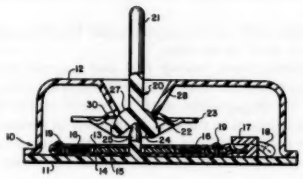
mounting means for mounting said microphone in a fixed physical relationship with said diaphragm and said loudspeaker.

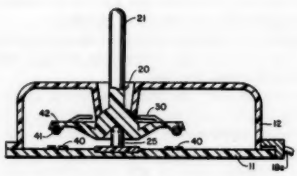
4,511,769

MULTI-PATH INTERRUPTER DEVICE

Diran R. Sahakian, Noisy le Sec; Lucien Pellerin, Septeuil, and Sjoerd Nijboer, Carrieres, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 11, 1983, Ser. No. 522,073
Claims priority, application France, Aug. 20, 1982, 82 14400
Int. Cl.³ H01H *13/70, 25/00*
U.S. Cl. 200—6 A **2 Claims**





1. A multi-path interrupter device, comprising:

a housing (**10**) which includes a first part (**11**) connected to a second part (**12**);

a plurality of contact means for acting as an electrical inter-

rupter, distributed along a circle and joined to the first part of the housing;

a control member (20) formed of a single piece of resilient material, the control member and the plurality of contact means being accommodated between the first and the second parts of the housing, the control member including:

a control lever integral therewith, the control lever having, at one end, a pin (21) emerging from the housing through an opening of the second part of the housing (12), the other end of the control lever being supported by a central pivot (25) carried by the first part of the housing, so that the control lever can be inclined in different directions from a central rest position,

resilient return means for biasing the control member, the resilient return means including parts integrally formed with the control member, the parts being elastically deformable and arranged so that the parts bear on abutment means carried by the second part of the housing, whereby the resilient return means biases the control member to the central rest position, and

a peripheral crown (23) arranged to act on at least one of the contact means when the control lever is manually inclined;

characterized in that the parts of the control member (20) constituting the resilient return means include a plurality of tongues (30) radially cut from a disc-shaped part (22) of the control member, the disc-shaped part connecting the control lever to the peripheral crown (23), the flexible ends of the plurality of tongues facing the center of the disc-shaped part (22), and the opening of the second part of the housing being formed by a truncated cone (28) extending into the interior of the housing and having an axis which substantially coincides with the axis of the central pivot, the abutment means including a lateral outer surface of the truncated cone.

4,511,770

ROTARY SWITCH

Kenji Hayashida, Muko, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Dec. 13, 1983, Ser. No. 561,092

Claims priority, application Japan, Dec. 28, 1982, 57-231157

Int. Cl.³ H01H *19/20, 19/60*

U.S. Cl. 200—6 B **11 Claims**

1. A rotary switch comprising:

a case;

a rotary shaft inserted into the case to be rotatably supported thereto;

a disc having teeth on its periphery and fixedly mounted on the rotary shaft in the case;

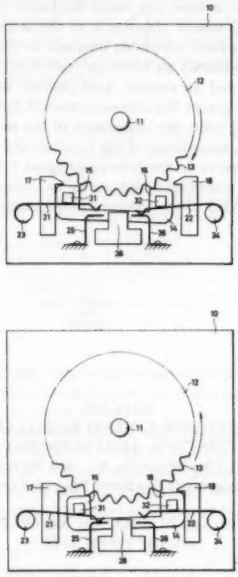
an engagement piece having first and second protrusions respectively on the sides of first and second end portions thereof for engagement with the teeth of the disc and disposed adjacent to the disc in the case in a manner to be movable substantially in parallel to the tangential direction of the disc and pivotable about each end portion thereof;

first and second resilient pieces disposed in the case to press at their free ends the first and second protrusions, respectively, against the periphery of the disc;

a first contact piece disposed in the case in opposing relation to the free end portion of the first resilient piece on the opposite side from the disc;

first and second lock members provided in the case for engaging the first and second end portions of the engagement piece, respectively, each in such a manner as to receive the tangential movement of the engagement piece and the pressing force of the engagement piece applied thereto from corresponding one of the first and second resilient pieces;

wherein when the disc is rotated in one direction the engagement piece is driven into a state where the second end portion of the engagement piece is in engagement with the second lock member, the second protrusion is out of engagement with the disc, the first end portion of the engagement piece is out of engagement with the first lock member and the first protrusion is in engagement with the disc, and performs pivotal movement about the second end portion to produce ON-OFF switchings between the first resilient piece and the first contact piece as the teeth of the disc cross over the first protrusion, and when the



disc is rotated in the opposite direction the engagement piece is driven into another state where the first end portion of the engagement piece is in engagement with the first lock member, the first protrusion is out of engagement with the disc, the second end portion of the engagement piece is out of engagement with the second lock member and the second protrusion is in engagement with the disc, and performs pivotal movement about the first end portion.

4,511,771

ELECTRIC FENCE GATE SWITCH

Thomas L. Rossell, R.R. 2, Box 313-3, Clayton, Ind. 46118

Filed Jan. 30, 1984, Ser. No. 575,004

Int. Cl.³ H01H *3/16*

U.S. Cl. 200—61.73 **2 Claims**

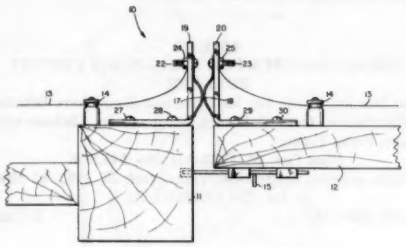
1. An electric fence gate switch for controlling the flow of electricity across spaced electric fence wires in association with the opening and closing of an electric fence gate, comprising:

first and second insulating members adjustably mounted to the gate post and fence post of an electric fence, said first and second insulating members being horizontally spaced apart L-shaped mounting brackets having outwardly extending legs having mutually facing and opposed sides;

a first conducting means including a resilient leaf spring mounted to the facing side of the first of said L-shaped mounting brackets,

a second conducting means mounted to the facing side of the second of said L-shaped mounting brackets; and

a means, mounted to each of said L-shaped mounting brackets, for electrically connecting said first and second conducting means to said spaced electric fence wires with said wires mounted on said opposed sides of said L-shaped

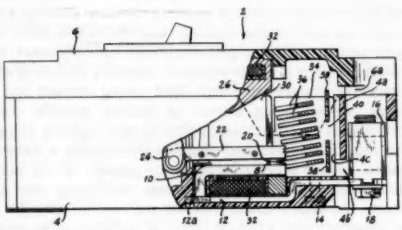


mounting brackets, said leaf spring and said second conducting means resiliently urged together under spring tension from said spring when said gate is in a closed position, whereby said switch automatically closes as said gate is pivoted into a closed position without having to manually connect said first and second conducting means after said gate is moved to its closed position.

4,511,772
ARC EXTINGUISHING STRUCTURE FOR ELECTRICAL SWITCHING DEVICE

Donald A. Link, Hubertus; John A. Swessel, Jr., Milwaukee, and Peter J. Theisen, West Bend, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 11, 1983, Ser. No. 493,479
Int. Cl.³ H01H *33/08*
U.S. Cl. 200—144 R **16 Claims**



1. An electric circuit breaker comprising in combination:

an insulating housing;

separable contacts in said housing;

means for operating said contacts between open and closed positions; and

arc extinguishing means comprising:

a plurality of arc plates arranged in spaced-apart relation along a separation route of said contacts for receiving an electric arc and exhausting ionized gases associated with said arc in a path toward an imperforate section of a transverse endwall of said housing;

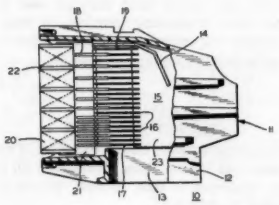
an unobstructed opening in said endwall adjacent said imperforate section defining a passageway extending interiorly of said hosing for exhausting said gases exteriorly of said housing; and

imperforate barrier means spacially interposed between said arc plates and said endwall transversely of said path of said gases and extending into said path for diverting said gases around said barrier toward said passageway, thereby increasing the length of said path for exhausting said gases through said passageway.

4,511,773
MOLDING COMPOSITION FOR ARC CIRCUIT BREAKERS

Eldon B. Heft, West Hartford, Conn.; Irvin C. Huseby, and Jan W. Szymaszek, both of Schenectady, N.Y., assignors to General Electric Company, New York, N.Y.

Continuation-in-part of Ser. No. 382,848, May 27, 1982, Pat. No. 4,413,062. This application Aug. 3, 1983, Ser. No. 519,935
Int. Cl.³ H01H *33/08*
U.S. Cl. 200—144 C **4 Claims**



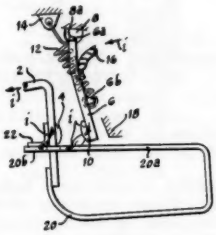
1. An improved circuit breaker arc chute of the type having a molded case forming two sidewalls and supporting a plurality of metal arc plates and insulated arc splitter plates, the improvement comprising:

said arc splitter plates being formed from insulating material having the composition of calcined wollastonite.

4,511,774
CURRENT LIMITING CONTACT ARRANGEMENT

Kenneth A. Forsell, Port Washington, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 8, 1983, Ser. No. 559,503
Int. Cl.³ H01H *33/20, 33/16*
U.S. Cl. 200—147 R **10 Claims**



1. A current limiting contact arrangement comprising, in combination:

stationary and movable contact means providing spaced parallel oppositely directed current paths therein, said movable contact means being biased for engagement with said stationary contact means and being separable therefrom by electromagnetic repulsion forces established by fault currents in said stationary and movable contact means; and

an arc runner having a first end electrically connected to said stationary contact means through normally closed contact means, a transfer segment adjacent said first end extending along a path of movement of said movable contact means, and a continuing portion extending from said transfer segment to a second end which is electrically

connected to said stationary contact means at a point distinct from said connection of said first end thereto;

wherein initial separating movement of said movable contact means from said stationary contact means establishes an electric arc therebetween, said arc being directed from said movable contact means away from said stationary contact means onto said transfer segment during continued separating movement of said movable contact means for establishing an arc current path from said movable contact means through said transfer segment and said normally closed contact means to said stationary contact means, and

wherein forces associated with gases produced by said arc effect opening of said normally closed contact means for interrupting said arc current path therethrough and redirecting said arc current path through said transfer segment and said continuing portion to said stationary contact means for increasing the resistance of said arc current path and the voltage of said arc.

4,511,775

CIRCUIT BREAKER

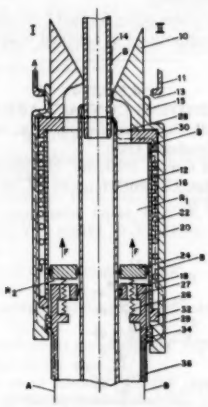
Gerhard Korner, Schriesheim; Horst Plettner; Walter Viering, both of Hanau, and Volker Rees, Darmstadt, all of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 8, 1982, Ser. No. 416,027

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1981, 3141324

Int. Cl.³ H01H *33/88*

U.S. Cl. 200—148 A **19 Claims**



1. A circuit breaker, in particular a high-voltage circuit breaker, insulated by SF_6 gas, comprising, a fixed contact part, a movable switching piece, the movable switching piece being provided with a blast nozzle and adapted to be actuated by a drive, a SF_6 gas containing compression space being decreased in volume during the process of tripping out such that a flow of the SF_6 gas is directed by the blast nozzle toward the arc being produced during the tripping out, the compression space being bounded by a piston-cylinder arrangement for generating the gas flow during the process of tripping out, the piston-cylinder arrangement being such that at least one of a movable piston and a movable cylinder is pulled toward at least one of a stationary cylinder bottom and a stationary piston head, respectively, the compression space being concentrically surrounded by a coil for generating a magnetic field, said coil being adapted to be switched into the current path such that during the process of tripping out a short-circuit current does not flow through the coil until disconnection has been effected at a main contact point of the breaker, a cylindrical inner shell is provided inside a cylindrical outer shell which bounds the compression space externally, the inner shell being arranged with a clearance relative to the outer shell and being insulated therefrom, the coil being located between the outer and inner cylindrical shells, an auxiliary piston being movably arranged in the compression space, the auxiliary piston being adapted to be driven by the magnetic field toward the contact point to render the compression space still smaller.

4,511,776

BREAK CHAMBER FOR A GAS-BLAST CIRCUIT BREAKER

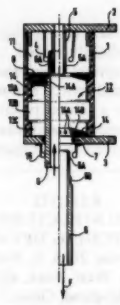
Roger Romier, Sainte Foy les Lyon, and Jean-Pierre Bétolière, Villeurbanne, both of France, assignors to Alsthom-Atlantique, Paris, France

Filed Oct. 26, 1983, Ser. No. 545,580

Claims priority, application France, Oct. 28, 1982, 82 18099

Int. Cl.³ H01H *33/70*

U.S. Cl. 200—148 A **6 Claims**



1. A break chamber for a gas-blast circuit breaker, the chamber comprising an insulating cylindrical housing containing the following contacts disposed coaxially: a fixed arcing contact; a fixed main contact; and a moving contact passing axially through one end of the housing; said moving contact being tubular and, in the closed position of said circuit breaker, being penetrated over a given penetration length by said fixed arcing contact, the diameters of said fixed arcing contact and said moving contact being chosen to exclude metallic contact therebetween in said closed position; said housing being divided into first and second chamber portions by a transverse partition having a central orifice for passage of the moving contact, said first chamber portion containing said fixed contacts, the improvement wherein said second chamber portion comprises two adjacent zones of differing cross sections including a zone of smaller cross section disposed next to said orifice and constituting a cylinder, a piston in the form of an annular disk fixed to the moving contact and having an outside diameter close to that of said zone of smaller cross section, the stroke of said piston running from said orifice to the end of said second portion, and the axial length of the zone of smaller cross section being substantially equal to said given penetration length over which said fixed arcing contact penetrates into said moving contact when the circuit breaker is in said closed position.

4,511,777

PERMANENT MAGNET THERMAL ENERGY SYSTEM

Frank Gérard, 12020 Brooknoll Dr., Kingsville, Md. 21087

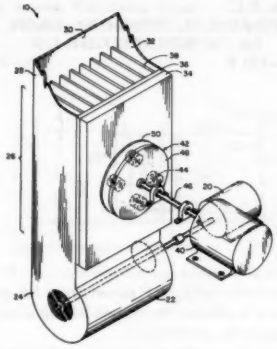
Filed Jul. 19, 1984, Ser. No. 632,287

Int. Cl.³ H05B *6/10*

U.S. Cl. 219—10.51 **7 Claims**

1. In a system for heating fluid through means for transferring heat to fluid by rotation of elongate magnets arranged in a circular array adjacently to the means for transferring heat,

with every other magnet oriented to have opposite polarity from the magnets adjacent thereto, the improvement comprising the means for transferring heat including: a plenum, a plurality of heat-sinks in said plenum, each of said heat sinks having first and second end portions, a ferro-magnetic plate, a



heat absorber plate, the plurality of heat-sinks being integral at the first end portions with the heat absorber plate and passing through respective apertures in the ferro-magnetic plate to respective second end portions of the heat sinks in the plenum, and means for passing fluid through said plenum, for transfer of heat thereto.

4,511,778

IMAGE FIXING DEVICE UTILIZING A HIGH FREQUENCY WAVE

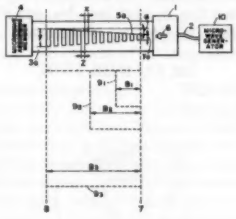
Tohru Takahashi, Tokyo; Hatsuo Tajima, Matsudo; Michio Shigenobu, Tokyo, and Shigemichi Washiyama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1981, Ser. No. 327,688

Claims priority, application Japan, Dec. 11, 1980, 55-174892; Dec. 11, 1980, 55-174904

Int. Cl.³ H05B *6/78;* **G03G** *15/00*

U.S. Cl. 219—10.55 A **36 Claims**



1. A fixing device comprising:

means defining a high-frequency wave guide for causing a high-frequency wave to travel in a direction intersecting the direction of movement of image bearing members of various width sizes bearing thereon an unfixed image formed by image formation means and for applying the high-frequency wave to said image bearing members to fix the unfixed image on said image bearing members;

means for inputting the high-frequency wave to one side of said applying means; and

means for conveying said image bearing members such that one side edge of each image bearing member, regardless of its width size, moves along a common conveyance reference which intersects the travelling direction of the high-frequency wave, such that said image bearing members of various width sizes are all conveyed on one side of said common reference;

whereby substantially uniform fixation is obtained regardless of the width size of the image bearing members.

4,511,779

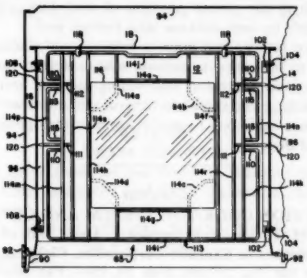
MICROWAVE OVEN SHELF

Arnold M. Bucksbaum, Cedar Rapids, and James E. Simpson, Coralville, both of Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed Mar. 7, 1983, Ser. No. 472,448

Int. Cl.³ H05B *6/64*

U.S. Cl. 219—10.55 E **11 Claims**



1. A microwave oven comprising:

a conductive cavity having parallel side walls;

means for energizing said cavity with microwave energy;

microwave transparent brackets connected to said side walls of said cavity;

a metal rod rack for providing a shelf in said cavity, said rack having metal rods extending outwardly in a lateral direction for supporting said rack in a horizontal position from said brackets; and

said rack comprising a quarter wavelength choke for substantially preventing electric currents from being excited in said outwardly extending support rods by said microwave energy.

4,511,780

DOOR LATCH ASSEMBLY FOR MICROWAVE HEATING APPARATUS

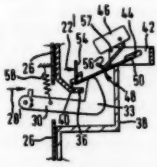
Yoshio Okamura, Nagoya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 23, 1983, Ser. No. 554,809

Claims priority, application Japan, Jan. 14, 1983, 58-4629

Int. Cl.³ H05B *6/76*

U.S. Cl. 219—10.55 C **6 Claims**



1. A microwave heating apparatus including a cabinet for defining a heating chamber having an access opening at one side thereof, a door mounted on said cabinet for closing said access opening, a cooking start button and a microwave generator for radiating microwave energy into said heating chamber, said apparatus comprising:

a front panel formed in said cabinet for contacting with said door and having an aperture therein;

a lever pivotally connected to said door at one end thereof and provided at the other end with a hook for insertion into said aperture;

a locking mechanism for locking said door in the closed position, said locking mechanism comprises a locking member secured to said cabinet to cooperate with said hook, and a holding member for forming a space adjacent said aperture to receive said hook in the closed position of said door;

a switch coupled in circuit with said microwave generator for actuating same, said switch being mounted in said cabinet;

a sliding member mounted between said hook and said switch in the closed position of said door and slidably movable by said cooking start button; and

means for biasing said hook to contact said sliding member so as to bias same to actuate said switch to turn on said microwave generator, said sliding member automatically deactuating said switch to turn off said microwave generator when said hook begins to move to the opened position of said door.

4,511,781

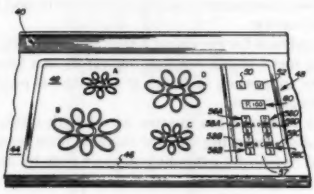
INDUCTION COOK-TOP SYSTEM AND CONTROL

Raymond M. Tucker, and Clarence L. Dyer, both of Cleburne, Tex., assignors to Rangaire Corporation, Cleburne, Tex.

Division of Ser. No. 237,449, Feb. 23, 1981, Pat. No. 4,453,068, which is a continuation of Ser. No. 35,084, May 1, 1979, abandoned. This application Feb. 21, 1984, Ser. No. 581,865

Int. Cl.³ H05B *6/06*

U.S. Cl. 219—10.77 **2 Claims**



1. In an induction cooking system, the combination comprising:

a plurality of induction heating coils operable at a plurality of power levels;

energization means for electrically energizing said plurality of induction heating coils;

a first touch control pad associated with each one of said plurality on induction heating coils for being touched to increase the output of said energization means to thereby increase the power level of said associated one of said plurality of induction heating coils;

a second touch control pad associated with each one of said plurality of induction heating coils for being touched to decrease the output of said energization means to thereby decrease the power level of said associated one of said plurality of induction heating coils;

a digital microprocessor responsive to said energization control signals generated by said first and second touch control pads for actuating and controlling said energization means to thereby vary the energization of said plurality of induction heating coils; and

a single display means associated with said plurality of induction heating coils interconnected to said digital microprocessor for alternately and selectively displaying at a single predetermined location on said single display means a representation of the instantaneous power level of a selected one of said plurality of induction heating coils.

4,511,782

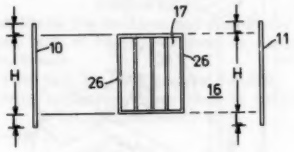
PLASMA SWEEPER TO CONTROL THE COUPLING OF RF POWER TO A MAGNETICALLY CONFINED PLASMA

Robert W. Motley, Princeton, and James Glanz, Lawrenceville, both of N.J., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 25, 1982, Ser. No. 436,558

Int. Cl.³ B23K *9/00*; G21B *1/00*

U.S. Cl. 219—121 P **13 Claims**



1. A device for coupling RF power from RF power introducing means to a plasma, the plasma having a magnetic field associated therewith, comprising:

one or more electrodes positioned near the edge of the plasma and near the RF power introducing means; and

means for supplying a positive potential at each electrode for generating a static electric field at each electrode directed into the plasma, each electric field having a component substantially perpendicular to the plasma magnetic field such that a non-zero vector cross-product of the electric and magnetic fields exerts a force on the plasma causing the plasma to drift.

4,511,783

METHOD FOR MAKING ELECTRICAL CONTACTS TO DIAMOND BY MEANS OF A LASER, AND DIAMOND PROVIDED WITH CONTACTS ACCORDING TO THIS OPTICAL METHOD

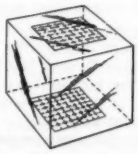
Eduard A. Burgemeister, Abcoude, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft" , Netherlands

Filed Feb. 3, 1983, Ser. No. 463,474

Claims priority, application Netherlands, Feb. 4, 1982, 8200430

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LM **7 Claims**



1. A method for making electrical contacts to a diamond to be used as radiation or heat sensitive detector including the steps of

(a). providing two different faces on the diamond,

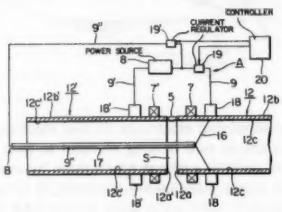
(b). radiating at least a part of each of said faces with a laser beam such that said parts are transformed into graphite layers with a sheet resistivity in the range of 5 to 100 ohms, and

(c). providing an electrical connection to each of the graphite layers.

4,511,784
METHOD FOR WELDING BY MAGNETICALLY DRIVEN ARC

Hideaki Miyamori, Hatano; Kenji Takagi, Yokohama; Shigeru Sato, Ebina; Fujio Takahashi, Yokohama, and Mikio Ozawa, Kanagawa, all of Japan, assignors to Nippon Kokan Koji Kabushiki Kaisha, Yokohama, Japan

Filed Apr. 15, 1983, Ser. No. 485,184
Int. Cl.[3] B23K 9/08
U.S. Cl. 219—123 9 Claims



1. In a method for welding together two objects of welding by a magnetically driven arc, each object of welding having a first surface, a reverse surface, a thickness between said first and reverse surfaces, and an end edge comprising the steps of:

placing two objects of welding in butt formation with a small gap between the end edges thereof, said small gap forming a welding line between said two objects of welding; connecting said two objects of welding to a welding power source by a cable to form an electric circuit comprising said welding power source, said cable and said two objects of welding; flowing a welding current through said electric circuit to produce an arc in said small gap between said two objects of welding; providing a magnetizing coil in parallel with said welding line between said two objects of welding, near said end edge of each of said two objects of welding, said magnetizing coils producing a magnetic flux in said small gap in the thickness direction of said two objects of welding; moving said arc along said welding line under the effect of an electromagnetic force in the direction of said welding line produced by said magnetic flux and said welding current flowing through said arc; heating said end edges of said two objects of welding to a welding temperature with the heat of said arc along said welding line; and pushing said heated end edges of said two objects of welding against each other to weld together said two objects of welding along said welding line;

the improvement comprising:

dividing said electric circuit for producing said arc in said small gap between said two objects of welding into a first electric circuit and a second electric circuit, said first electric circuit comprising said two objects of welding and a cable arranged on the first surface side of said two objects of welding, said second electric circuit comprising said two objects of welding and another cable arranged on the reverse surface side of said two objects of welding, and said first electric circuit and said second electric circuit being connected in parallel to said welding power source so that the direction of magnetic flux interlinking with a first region surrounded by said first electric circuit and the direction of magnetic flux interlinking with a second region surrounded by said second electric circuit are opposite to each other;

changing the amount of said welding current flowing through said first electric circuit to control the strength of a first electromagnetic force in the thickness direction of said two objects of welding produced by said welding current flowing through said first electric circuit and said magnetic flux interlinking with said first region surrounded by said first electric circuit; and

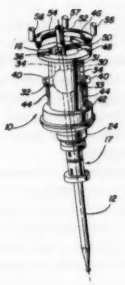
simultaneously changing the amount of said welding current flowing through said second electric circuit to control the strength of a second electromagnetic force, having a direction opposite to the direction of said first electromagnetic force, in the thickness direction of said two objects of welding produced by said welding current flowing through said second electric circuit and said magnetic flux interlinking with said second region surrounded by said second electric circuit;

thereby continuously and controllably moving said arc produced in said small gap between said two objects of welding in the thickness direction of said end edges of said two objects of welding by the difference in strength between said first electromagnetic force and said second electromagnetic force, so that said end edges of said two objects of welding are uniformly heated to a welding temperature in said thickness direction with the heat of said arc.

4,511,785
SEAM TRACKER

William L. Arter, Fullerton, and Foster R. Williams, Seal Beach, both of Calif., assignors to Jetline Engineering, Inc., Irvine, Calif.

Filed Feb. 27, 1984, Ser. No. 584,241
Int. Cl.[3] B23K 9/12
U.S. Cl. 219—124.34 13 Claims



1. In a welding machine having a seam tracking apparatus, having a probe positioned in, and responsive to relative movement respective to the probe of, a welding zone and a control apparatus for modifying the position of a welding head responsive to an output signal from the seam tracking apparatus, an improved apparatus for generating the output signal responsive to the movement of the probe in either of two possible degrees of freedom, comprising:

a seam tracker mounting unit having a longitudinal axis, and having an open ended interior opening of generally cylindrical shape with a first and second end and a longitudinal axis corresponding to that of the mounting unit;

a shaft connected to the probe at one end thereof and extending through the length of the interior opening, with a portion of the shaft forming a position-indicator-member;

a pin having a longitudinal axis and connected to the shaft with opposing exterior ends thereof extending on either side of the shaft;

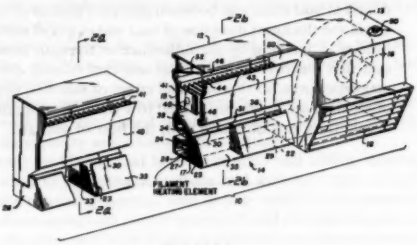
a pair of opposed slots on the mounting unit each disposed to receive a respective one of the ends of the pin; and

a pair of springs each disposed on the outside of the mounting unit and connected to a respective end of the pin to urge each end of the pin into abutment with an end of the respective slot of each end of the pin, thereby resiliently urging the pin against movement in the slots.

4,511,786
FORCED AIR DISTRIBUTOR FOR BASEBOARD HEATER

Friedrich W. Jansen, Prince George, Canada, assignor to P.J. Industrial Safety Elec. Co. Ltd., Prince George, Canada

Filed Apr. 9, 1982, Ser. No. 366,863
Int. Cl.³ F24H *3/12, 9/02*; H05B *1/00*
U.S. Cl. 219—364 **6 Claims**



1. A forced air distributor for supplying air to the air intake of a baseboard heater, the air intake being an elongated slot in the lower side of the baseboard heater, which distributor comprises:

(a) a duct assembly enclosing a pair of adjacent elongated air passageways comprising an inner air passageway and an outer air passageway extending from an open end thereof a preselected distance to a terminal end, and a single elongated air passageway of a cross sectional area substantially equal to the combined cross sectional area of said pair of air passageways extending from said terminal end to a closed end of said assembly, said duct assembly further having an elongated air discharge orifice along an upper longitudinally extending side thereof, communicating with an outer one of the pair of air passageways and the single air passageway;

(b) a mesh baffle positioned at about half way along the length of said outer air passageway and a further mesh baffle at the end of said outer air passageway each baffle extending over the cross sectional area of said outer air passageway and a further mesh baffle at about half way along the length of the single elongated air passageway and extending over the cross sectional area of said single elongated air passageway;

(c) air pump means for supplying air under superatmospheric pressure into the open end of said duct assembly in response to electrical current provided by an external source of electrical energy; and

(d) an elongated air deflector mounted on said duct assembly along an edge of said discharge orifice closest to a wall mounting surface of said assembly and generally inclined to lie in a direction of air flow into the air intake of said baseboard heater.

4,511,787
ELECTRIC STOVE PIPE SPACE HEATER

Frank Sibert, 135-D High Point Blvd., Boynton Beach, Fla. 33435

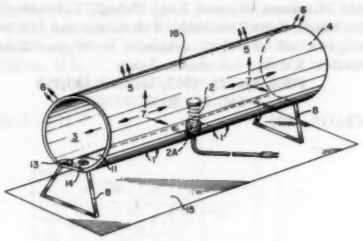
Continuation-in-part of Ser. No. 333,384, Dec. 22, 1981, abandoned. This application Feb. 2, 1983, Ser. No. 442,774
Int. Cl.³ F24H *3/04, 9/00*
U.S. Cl. 219—374 **5 Claims**

1. An electric space heater comprising:

an elongated horizontally-disposed cylindrical hollow metal pipe having opposite open ends and a bottom portion with a longitudinally extending opening substantially extending along the entire length of said hollow metal pipe for allowing air to be heated to enter into said pipe;

support means for supporting said pipe above a surface;

an electric heating element mounted substantially equidistant from both ends of said pipe at said bottom portion; and

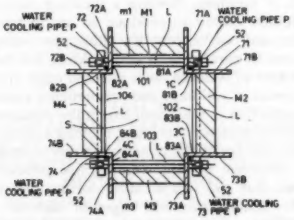


means for supplying electricity to said electric heating element to enable said heating element to heat the pipe by radiation and the ambient atmosphere by convection.

4,511,788
LIGHT-RADIANT HEATING FURNACE

Tetsuji Arai, Tachikawa, and Yoshiki Mimura, Yokohama, both of Japan, assignors to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1984, Ser. No. 574,453
Claims priority, application Japan, Feb. 9, 1983, 58-18870; Feb. 9, 1983, 58-18871
Int. Cl.³ H05B *3/06*; F27B *5/14*
U.S. Cl. 219—405 **3 Claims**



1. A light-radiant heating furnace comprising an assembly of:

at least a first, second and third frame members, each of which has two plate portions, arranged in such a manner that one of the plate portions of the first frame member opposes one of the plate portions of the second frame member disposed adjacent to the first frame member, and the other plate portion of the first frame member opposes one of the plate portions of the third frame member disposed adjacent to the first frame member at a side different from the second frame member;

a plurality of lamps making up a first plane light source unit and supported between the first frame member and the second frame member with sealed end portions thereof positioned at one side, extending out through first supporting holes formed through said one of the plate portions of the first frame member;

another plurality of lamps making up a second plane light source unit and supported between the first frame member and the third frame member with sealed end portions thereof positioned at one side, extending out through second supporting holes formed, at levels different from the first supporting holes by a distance at least equal to an outer diameter of the lamp, through said other plate portion of the first frame member;

a first reflector fixed to the first frame member in such a

manner that the first reflector assumes a position predetermined relative to the first supporting holes and extends between the first frame member and the second frame member; and

a second reflector fixed to the first frame member is such a manner that the second reflector assumes a position predetermined relative to the second supporting holes and extends between the first frame member and the third frame member.

4,511,789

HEATING ELEMENT, PARTICULARLY RADIANT HEATING ELEMENT FOR HEATING GLASS CERAMIC PLATES

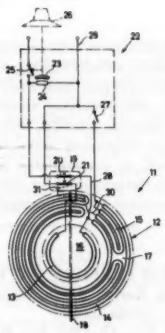
Gerhard Goessler, Oberderdingen, and Eugen Wilde, Knittlingen, both of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,157

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1982, 3234349; Apr. 21, 1983, 3314501

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—446 **14 Claims**



1. A radiant heating element for heating glass ceramic plates in cookers, having first and second non-overlapping heating zones, the heating element comprising:

at least one electrical heating resistor disposed in each of the first and second heating zones;

means operable selectively for energizing the at least one heating resistor of the first heating zone independently of the at least one heating resistor in the second heating zone and for simultaneously energizing the at least one heating resistors in both the first and second heating zones, the at least one heating resistor of the first heating zone being thereby always energized during operation of the heating element; and,

means for connecting at least one heating resistor of the second heating zone in series with the at least one heating resistor of the first heating zone, whereby operation of only the first heating zone provides more concentrated heating at a higher power level than simultaneous operation of both heating zones, simultaneous operation of both heating zones providing uniform heating at a lower power level.

4,511,790

MULTIPLE LOAD CONTROL APPARATUS HAVING LOAD EQUALIZATION

Norman M. Kozak, Greendale, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

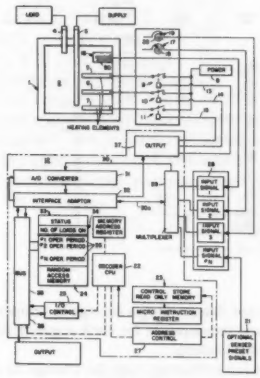
Filed Sep. 30, 1982, Ser. No. 430,258

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—486 **16 Claims**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 034 Pages)



1. A water heater apparatus comprising a water storage tank having a plurality of separate heating means, comprising a plurality of power supply connectors one for each of said heating means and operable to energize the corresponding heating means and establish "on" periods and "off" periods of energization, sensor means for sensing the temperature of the water in the storage tank and establishing an output signal proportional to the water temperature, temperature preset means for establishing a signal proportional to a predetermined desired water temperature, status means to record the number of heating means in "on" periods in operation and to record the accumulated "on" periods and thereby the accumulated operating time of energization over a plurality of periods of each of said heating means, controller logic means for comparing the output of the sensor means and the preset means and said heating means in the "on" period to establish the number of activated heating means, and said controller logic means connected to said status means and having operating means operable to turn the heating means on and off in accordance with the historical accumulated operating time inclusive of a plurality of past "on" and "off" periods of operation and thereby the relative accumulated operating time of energization of each of said heating means.

4,511,791

ELECTRONIC BALANCE METER

Avinash J. Desai, Reynoldsburg, Ohio, and Gerhard Kreikebaum, Knoxville, Tenn., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 25, 1983, Ser. No. 488,489

Int. Cl.³ H05B *1/02*

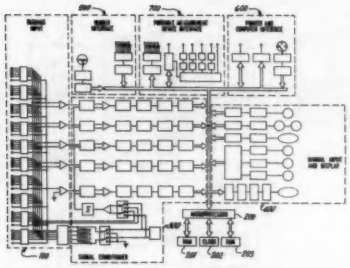
U.S. Cl. 219—497 **6 Claims**

1. An apparatus for measuring the temperature is segments of an electrical resistance heated glass fiber producing bushing and for displaying the change in temperature of each segment of the bushing comprising:

(a) a glass fiber producing bushing, compartmentalized into individual segments, electrically heated by passing an electrical current through the bushing;

(b) means to supply an electrical current to flow in the bushing;

(c) means for determining the electrical current flowing in a glass fiber producing bushing;
(d) means for simultaneously determining a voltage drop across each segment of the glass fiber producing bushing;
(e) means to calculate a resistance and a temperature from the resistance for each segment of the glass fiber producing bushing;
(f) means for storing the temperature of each segment of the glass fiber producing bushing;



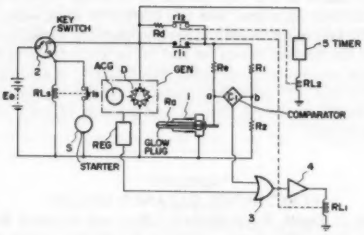
(g) means for determining a change in temperature by use of the stored temperature for each segment of the glass fiber producing bushing;
(h) means for indicating that the change in temperature of any of the segments of the glass fiber producing bushing is outside a predetermined range; and
(i) means to display the change in temperature of each segment of the glass fiber producing bushing.

4,511,792

VOLTAGE CONTROL CIRCUIT FOR PROTECTING GLOW PLUG FROM OVERHEATING

Hideo Kawamura, Kanagawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Jun. 28, 1982, Ser. No. 392,519
Claims priority, application Japan, Jun. 30, 1981, 56-102071; Jun. 30, 1981, 56-102072
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—499 **8 Claims**



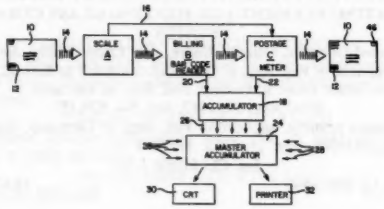
1. A circuit for controlling a voltage applied to a glow plug having a heating element, and for protecting the glow plug from being overheated, said circuit comprising:
sensing means for producing a signal when the power supply voltage exceeds a predetermined value;
a circuit network comprising a normally closed relay contact means, connected in parallel with a serially connected voltage-dropping resistor, for providing electrical contact between the power supply and the glow plug, and a normally open relay contact means for providing electrical contact between said voltage dropping reisitor and the glow plug, said circuit network being serially connected with the heating element of the glow plug and connectable to the power supply; and
a timer connectable to the power supply;
said normally closed relay contact means being opened in response to said sensing circuit producing said signal, and said normally closed relay contact means being opened in response to the temperature of the heating element exceeding a preset value which is below a steady-state heating temperature;
said normally open relay contact being closed by said timer a predetermined time after voltage is applied to the glow plug.

4,511,793

MAIL METERING PROCESS AND MACHINE

Sylvester Racanelli, 602 SE. 47th, Portland, Oreg. 97215

Filed Apr. 4, 1983, Ser. No. 481,747
Int. Cl.³ G06F *15/20*
U.S. Cl. 235—375 **6 Claims**



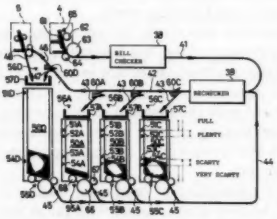
1. A postage metering and allocation machine comprising; a mail receiving station, a code reading station, a postage metering station, and transporting means for transporting mail individually from the mail receiving station to the code reading station and the metering station, said code reading station adapted to read a designated accounting number code imprinted on the mail, an accumulator, and transmitting means for transmitting to the accumulator the designated accounting number and the postage to be allocated to that number.

4,511,794

SYSTEM FOR PERFORMING TRANSACTIONS

Tutomu Imamichi, Kurita, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 17, 1982, Ser. No. 442,417
Claims priority, application Japan, Nov. 18, 1981, 56-185904; Nov. 18, 1981, 56-185905; Nov. 19, 1981, 56-186733
Int. Cl.³ G06F *15/30*
U.S. Cl. 235—379 **22 Claims**



1. A system for performing transactions comprising:
a cash handling device of the circulation type having cash containers for accommodating received cash as classified according to the kind of money and delivering cash from the containers for dispensing,

means for detecting the condition of cash in each of the containers, and

means for controlling the state of transaction according to the condition of cash detected.

4,511,795
CASH DISPENSING APPARATUS

John Wood, and Raymond J. Dominey, both of Hampshire, England, assignors to De La Rue Systems Limited, London, England

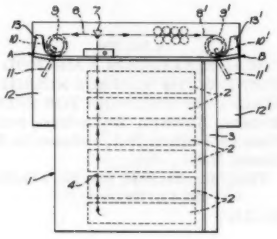
PCT No. PCT/GB82/00091, § 371 Date Nov. 19, 1982, § 102(e) Date Nov. 19, 1982, PCT Pub. No. WO82/03287, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 22, 1982, Ser. No. 448,890

Claims priority, application United Kingdom, Mar. 20, 1981, 8108828

Int. Cl.³ G06K *15/30*

U.S. Cl. 235—379 **7 Claims**



1. Cash dispensing apparatus comprising: at least one feed module (2) for storing banknotes and for delivering a selected sequence of banknotes; at least two stacking platforms (A, B), each platform having a dumping facility (11, 11') to dump a stack of banknotes supported on the platform; at least two dispensing stations (14A, 14A'; 14B, 14B') associated with each platform; a transfer means (13, 13') for each platform to transfer banknotes stacked on the platform to a selected one of the dispensing stations; diverter means (7), and a common flow-line (4) for banknotes leading from the feed modules (2) to the diverter means (7) which diverts them to a selected one (for example A) of the stacking platforms; detecting means (6) stationed on the common flow-line (4) for detecting the passage of multiple banknotes and for counting single banknotes; and central control means responsive to the detecting means (6) and to commands for a delivery of banknotes to a selected dispensing station (14A or 14A'); the central control means causing the diverter means (7) to divert single banknotes to the selected platform (A) associated with the selected dispensing station (14A, 14A'), but to divert multiple banknotes to another platform (B); causing the dumping facility at that other platform (B) to dump any multiple banknotes; and, if the detecting means (6) indicates an incorrect total count of single banknotes, also causing the dumping facility at the said selected platform (A) to dump the stack of single banknotes, but otherwise causing the transfer means (11) at that selected platform (A) to transfer the stack to the selected dispensing station (14A or 14A').

4,511,796
INFORMATION CARD

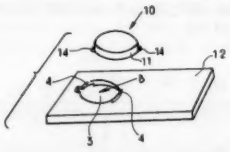
Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,239

Int. Cl.³ G06K *19/06*

U.S. Cl. 235—492 **7 Claims**

1. An information card comprising a card member having a hole defined therein including an information unit receiving portion of the hole in at least one inlet portion of the hole extending radially outwardly of the information unit receiving portion at at least one circumferential location, and an information unit including a holder having a semiconductor device being positionable in the receiving portion of the hole including at least one radially extending projection which is passable only through the inlet portion, said card member having at



least one groove extending circumferentially through an arc angle of less than 90°, said projection being alignable with the groove to permit limited rotation of said holder within the hole of said card member as the projection moves around the groove.

4,511,797
CIRCUIT ARRANGEMENT FOR POSITIONING THE PRINTING MECHANISMS IN PRINTERS EMPLOYING A D.C. MOTOR

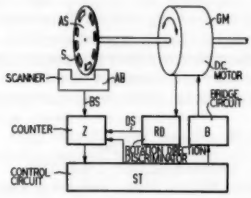
Dietmar Pohlig, Munich, and Ernst Goepel, Germering, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 31, 1983, Ser. No. 462,402

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3214554

Int. Cl.³ G01D *5/34*

U.S. Cl. 250—231 SE **4 Claims**



1. In a circuit arrangement for determining the position of a printing mechanism which is driven by a d.c. motor, of the type in which the motor rotates a slotted disc adjacent optical scanner means, the optical scanner means produces pulses in response to rotation of the disc, and in which a display-type counter counts the scanner means output pulses in a positive direction and in a negative direction and displays a count corresponding to the position of the printing mechanism, the improvement wherein:

said scanner means comprises a single-channel incremental scanner operable to produce scanner output pulses; and further comprising

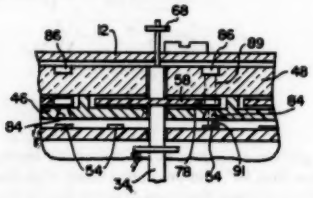
a rotation direction discriminator including an input connected to the d.c. motor for receiving a damped alternating voltage generated by the motor upon deceleration and an output connected to the counter, said discriminator operable in response to zero crossings of the generated voltage to produce an output signal to change the direction of counting of the counter.

4,511,798

METER ENCODING REGISTER WITH TAPERED APERTURE IN BAFFLE INSERT

Emmett D. Killingsworth, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 23, 1983, Ser. No. 469,070
Int. Cl.³ G01D 5/38; G08C 19/16
U.S. Cl. 250—231 SE **4 Claims**



1. A multiple shaft meter encoding register for a utility meter having a metering movement responsive to a metering quantity, comprising:

a frame;

a plurality of shafts rotatably mounted in the frame;

means for interconnecting the shafts with an associated metering movement for concurrently rotating the shafts at different predetermined rates in response to actuation by the associated metering movement;

means for generating electrical signals responsive to the position of the shafts and including a plurality of code members each fixedly mounted to a separate one of the shafts;

the electrical signal generating means comprising an illumination source and a plurality of encoding photosensitive components, each of the code members alternately transmitting and blocking illumination between the illumination source and the photosensitive components in response to rotation of the shafts;

baffle means between the illumination source and the photosensitive components for isolating light rays from the source and for avoiding ambient illumination, and

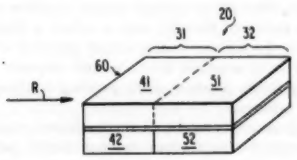
the baffle means including tapered apertures aligned with corresponding photosensitive components, each aperture having a smaller end nearer the illumination source and a larger end nearer the photosensitive component.

4,511,799

DUAL ENERGY IMAGING

Paul J. Bjorkholm, Sharon, Mass., assignor to American Science and Engineering, Inc., Cambridge, Mass.

Filed Dec. 10, 1982, Ser. No. 448,461
Int. Cl.³ G01T 1/16, 1/185, 1/20
U.S. Cl. 250—367 **8 Claims**



5. Apparatus useful in imaging comprising:

a source of penetrating radiant energy,

means for directing penetrating radiant energy emitted by said source to travel a path toward a target area,

detector means located beyond said target area along the path of said radiant energy for producing signals representative of radiant energy reaching said detector means, said detector means including:

first energy detector means for converting radiant energy to a first signal, said first energy detector means having a first detection efficiency as a function of radiant energy, and

second energy detector means located in said path but beyond said first energy detector means, for converting radiant energy to a second signal, said second energy detector means having a second detection efficiency, as a function of radiant energy, different from said first detection efficiency,

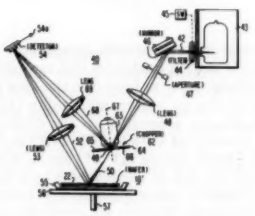
wherein said first detection efficiency has a lower sensitivity to radiant energy in a first energy range and said second detection efficiency has a lower sensitivity to radiant energy in a second, higher, energy range.

4,511,800

OPTICAL REFLECTANCE METHOD FOR DETERMINING THE SURFACE ROUGHNESS OF MATERIALS IN SEMICONDUCTOR PROCESSING

Gunther Harbeke, Affoltern, Switzerland, and Michael T. Duffy, Princeton Junction, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1983, Ser. No. 479,451
Int. Cl.³ G01N 21/57
U.S. Cl. 250—372 **5 Claims**



1. A method of determining the surface roughness of a specimen reflective material comprising:

(a) exposing a reference surface of a reference reflective material of predetermined reduced surface roughness to a first beam of radiation of a first wavelength from a source of radiation so that a portion of said first beam is reflected from said reference surface;

(b) exposing said specimen reflective surface to a second beam of radiation from said source so that a portion of said second beam is reflected from said surface, said second beam having a wavelength the same as the wavelength of said first radiation beam;

(c) detecting and measuring the intensity of said first and second reflected beams to obtain a first and a second intensity signal; and

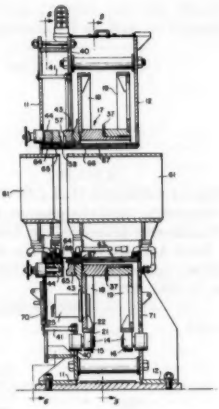
(d) comparing said first intensity signal with said second intensity signal to determine the difference between the two signals, the magnitude of said difference being a measure of the surface roughness of said specimen reflective material;

(e) wherein said method includes in alternate and rapid sequence reflecting said first beam to said detector and passing said second beam to said specimen surface for reflection to said detector, whereby said detector is alternately in rapid sequence providing substantially continuously said first and second intensity signals for rapid comparison.

4,511,801
RADIATION SCANNING AND MEASURING DEVICE

Edward J. Tatham; Richard Kravits, both of Bethlehem; John C. Clymer, Riegelsville, and Carvel D. Hoffman, Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jul. 19, 1982, Ser. No. 399,501
Int. Cl.[3] G01T *1/29*
U.S. Cl. 250—394 6 Claims

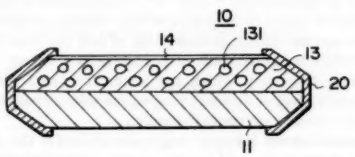


1. A scanning device for examining an object with penetrating radiation comprising a rotating source drum having a plurality of gamma ray radiation source devices, a fixed portion of the scanning device surrounding said rotating drum including a plurality of gamma ray radiation detectors mounted on said fixed portion and an adjustable shutter means concentric with said radiation device said adjustable shutter means including a shutter-half connected to said fixed portion and another shutter-half connected to said rotating source drum.

4,511,802
RADIATION IMAGE STORAGE PANEL

Masanori Ternoka, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed May 20, 1983, Ser. No. 496,731
Claims priority, application Japan, May 24, 1982, 57-87799
Int. Cl.[3] G21K *4/00*
U.S. Cl. 250—484.1 9 Claims

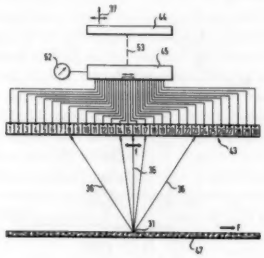


1. A radiation image storage panel comprising a substrate and a stimulable phosphor layer provided on said substrate, wherein at least a part of the edges of end faces of said radiation image storage panel on the substrate side is chamfered, and at least the end face of said radiation image storage panel including said chamfered edge is covered with a polymer film.

4,511,803
FAULT DETECTION APPARATUS FOR MATERIAL WEBS

Dieter Röss, Planegg, and Klaus Ostertag, Munich, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Division of Ser. No. 235,694, Feb. 18, 1981, Pat. No. 4,450,359.
This application Dec. 20, 1983, Ser. No. 563,601
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1980, 3006072
Int. Cl.[3] G01N *21/88*
U.S. Cl. 250—563 5 Claims

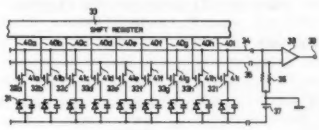


1. Fault detection apparatus for material webs comprising: a light scanning device for directing a bead of light along an imaginary line on the surface of a web to effect line scanning thereof, said web having a width; and an elongate light receiving device disposed to receive light leaving said line within a reception plane containing said line and said light receiving device; said light receiving device comprising: a linear array of individual light receivers, means for selectively switching said light receivers on or off in dependence on the position of said light bead along said line and for switching off at least one of said light receivers at each particular instant, said light receivers generating signals in response to incident light, and means connecting said receivers to a processing circuit for processing said signals.

4,511,804
NOISE REDUCTION APPARATUS FOR HYBRID IMAGE SENSOR

Takashi Ozawa, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 27, 1982, Ser. No. 382,838
Claims priority, application Japan, Nov. 13, 1981, 56-182091
Int. Cl.[3] H04N *5/30*
U.S. Cl. 250—578 10 Claims



1. A document sensing device comprising: means for sensing light reflected by a document and generating an output signal and comprising a plurality of photodetectors, means for storing said output signals received from said means for sensing light and comprising a plurality of MOSFET devices fabricated at a device location separately from said photodetectors, shift register means for selectively outputting the content of said means for storing signals by sequentially initiating the outputs of said means for storing said output signals, and output means whereby noise signals inherent in said stored signals are eliminated.

4,511,805

CONVERTOR FOR THERMAL ENERGY INTO ELECTRICAL ENERGY USING STIRLING MOTOR AND INTEGRAL ELECTRICAL GENERATOR

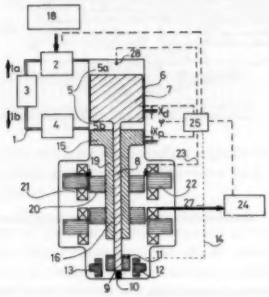
Jean-Louis Boy-Marcotte, Orsay; Gilbert M. I. Dahan, Paris; Michel Dancette, Vaucresson; Marcel P. Le Nabour, Limonest; Jean-Francois G. A. Pellerin, Boulogne; José Rivallin, Plaisir, and Marcel A. J. Jannot, Sarcelles, all of France, assignors to BERTIN & Cie, Plaisir, France

Filed Jul. 20, 1982, Ser. No. 400,064

Claims priority, application France, Jul. 21, 1981, 81 14185

Int. Cl.³ F02G *1/045*

U.S. Cl. 290—2 **13 Claims**



1. Convertor for converting into electrical energy the mechanical energy developed by a thermal piston motor operating along the Stirling thermodynamic cycle, comprising a hermetically sealed enclosure under pressure deprived of mechanical connection to the outside, said hermetically sealed enclosure enclosing a displacing piston guided thereby to induce therein pressure variations due to piston movements, a drive piston also guided thereby and having a face on which said pressure variations are directly exerted without recourse to physical transmission between said pistons, a linear electric generator having a movable magnetic component, and a positive mechanical transmission between said drive piston and said movable magnetic component whereby said magnetic component positively follows up said drive piston and in return any electric control affecting said magnetic component inherently reflects fully on said drive piston for achieving an overall control of the magnetic component and drive piston assembly.

4,511,806

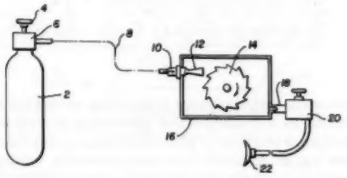
PRESSURE DROP POWER GENERATION

Michael G. May, Bel Air, Switzerland, assignor to AIR Ltd., Arlington, Va.

Filed May 22, 1984, Ser. No. 612,816

Int. Cl.³ F03B *13/00*

U.S. Cl. 290—43 **6 Claims**



1. A power generator apparatus including a pressurized gas source container having sufficient quantities of oxygen for breathing purposes, comprising

means for connecting said pressurized gas source to said power generator for transmission via a pressure drop in said gas source a gas pressure therethrough, said generator using at least a part of the flow rate of said gas pressure as a pneumatic energy input; and

means connecting said generator to a mouthpiece means, whereby said gas pressure is available for breathing.

4,511,807

ELECTRICAL GENERATOR CONTROL SYSTEM

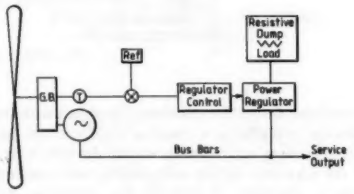
William M. Somerville, Kirkwhelpington, England, assignor to Northern Engineering Industries plc, Great Britain

Filed Apr. 1, 1983, Ser. No. 481,169

Claims priority, application United Kingdom, Apr. 20, 1982, 8211437; Jun. 2, 1982, 8216130

Int. Cl.³ H02P *9/04*

U.S. Cl. 290—44 **14 Claims**



1. An electrical generator control system comprising:

(a) an electric generator;

(b) a plurality of appliance resistors;

(c) a plurality of dump resistors;

(d) switches first and second ones of which are associated with said appliance resistors and said dump resistors, respectively, each said switch being operable, in response to increases or decreases in the frequency of the output of said generator, at a predetermined value of said output frequency, which operation, in the case of each appliance resistor, at least renders the respective resistor connectable to or disconnectable from said generator respectively to impose load thereon or to remove load therefrom and, in the case of each dump resistor, connects or disconnects the respective resistor to or from said generator respectively to impose load thereon or remove load therefrom, said predetermined values of frequency representing a range of values of frequency which increase progressively through said range, at least some of said first ones of said switches being operable at predetermined values of said output frequency which are lower than said predetermined values of frequency at which said second ones of said switches are operable; and

(e) control means for operating said switches at the respective frequencies, said control means comprising for each switch frequency pulse-generating circuitry for generating a train of frequency pulses corresponding to said output frequency, a timing pulse generator and counting means, changes in said output frequency being detectable as changes in the number of timing pulses counted by said counting means between successive frequency pulses in said train.

4,511,808

INSTALLATION FOR EXPLOITING WATER CURRENTS IN FLOWING WATERS BY MEANS OF A PLURALITY OF WATER WHEELS

Bernhard Jöst, Traminerweg, 4, D-6800 Mannheim, Fed. Rep. of Germany

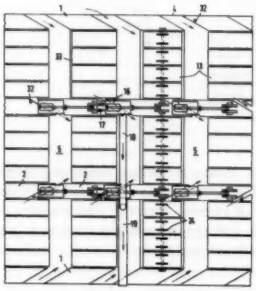
PCT No. PCT/DE81/00141, § 371 Date May 17, 1982, § 102(e) Date May 17, 1982, PCT Pub. No. WO82/01038, PCT Pub. Date Apr. 1, 1982

PCT Filed Sep. 12, 1981, Ser. No. 385,412

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 3034862

Int. Cl.³ F03B *7/00*

U.S. Cl. 290—54 **8 Claims**



1. In an installation for exploiting the energy of flowing water in a river stream of the type including a plurality of anchored pontoons, a plurality of water wheels mounted between said anchored pontoons and disposed in adjacent and successive rows, a plurality of generators having drive turbines and a plurality of piston pumps by which said water wheels drive said turbines of said generators, the improvement comprising:

said anchored pontoons including a plurality of pontoons disposed in outer and intermediate lateral rows, the pontoons in each row being arranged in tandem and so shaped with spacings therebetween and between adjacent rows to form a multiplicity of longitudinal channels to channel water flow from the front to the rear of the installation and a plurality of transverse channels to channel water flow from the side of the installation to its center so as to hinder water flow as little as possible, the installation being free of floor or lateral limitations disposed between respective outer pontoons and intermediate pontoons; and

said water wheels disposed in tandem having crankshafts connected to each other by connecting rods which, in turn, drive said double acting piston pumps, said piston pumps being slow running and having a relatively large stroke for drawing in river water and pumping said water through high pressure lines to pressure storage means, said pressure storage means communicating through pressure conduits to the turbine of a turbo-generator.

4,511,809

SWITCH CIRCUIT HAVING IMPROVED SWITCHING CHARACTERISTICS

Gordon H. Allen, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 27, 1983, Ser. No. 461,327

Int. Cl.³ H03K *17/60, 3/01*

U.S. Cl. 307—254 **2 Claims**

1. A switch circuit having a pair of outputs between which a load may be connected, comprising;

first and second respective paired switching transistor circuits each of which includes an upper transistor coupled to a respective one of the outputs and a lower transistor coupled respectively to the opposite one of the pair of outputs to which its paired upper transistor is coupled;

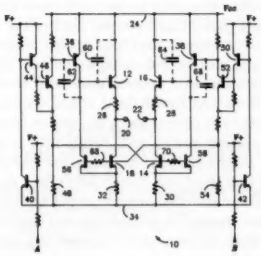
switching circuit means responsive to switching signals applied thereto for alternately rendering said first and second paired switching transistor circuits conductive for producing current through the load;

said upper transistor of each of said paired switching transistor circuits having an emitter coupled to a respective one of the pair of outputs, a collector coupled to a first power supply conductor, and a base;

said lower transistor of each of said paired switching transistor circuits having an emitter coupled to a second power supply conductor, a collector coupled to said emitter of the opposite one of said upper transistors respectively, and a base coupled to said switching circuit means;

first and second driver transistors each having a collector coupled to said base of a respective upper transistor, an emitter coupled to said first power supply conductor, and a base coupled to said switching circuit means;

a first transistor having an emitter; collector and base, said emitter being coupled to said emitter of said lower transistor of said second paired switching transistor circuit, said collector being connected to said base of said upper transistor of said first paired switching transistor circuit, and



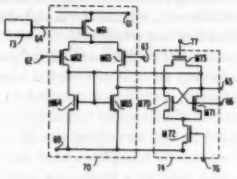
said base being coupled to said base of said lower transistor of said second paired switching transistor circuit, said first transistor being rendered conductive by said switching circuit means when said lower transistor of said second paired switching transistor circuit is rendered conductive for passing parasitic currents appearing at said base of said upper transistor of said first paired switching transistor circuit to said second power supply conductor, said first transistor otherwise being non-conductive; a second transistor having an emitter, collector and base, said emitter being coupled to said emitter of said lower transistor of said first paired switching transistor circuit, said collector being connected to said base of said upper transistor of said second paired switching transistor circuit, and said base being coupled to said base of said lower transistor of said first paired switching transistor circuit, said second transistor being rendered conductive by said switching circuit means when said lower transistor of said first paired switching transistor circuit is rendered conductive for passing parasitic currents appearing at said base of said upper transistor of said second paired switching transistor circuit to said second power supply conductor, said second transistor otherwise being non-conductive.

4,511,810

VOLTAGE COMPARATOR CIRCUIT

Akira Yukawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1982, Ser. No. 414,724
Claims priority, application Japan, Sep. 3, 1981, 56-138946
Int. Cl.³ H03K *5/24, 3/353*
U.S. Cl. 307—355 **18 Claims**



1. A comparator circuit comprising a first voltage terminal, a second voltage terminal, first and second input terminals, first to third nodes, a constant current source coupled between said first voltage terminal and said third node, said constant current source continuously generating a constant current, a first field effect transistor of a first conductivity type coupled between said first node and said third node, a second field effect transistor of said first conductivity type coupled between said second node and said third node, means for connecting a gate of said first field effect transistor to said first input terminal, means for connecting a gate of said second field effect transistor to said second input terminal, first load means coupled between said first node and said second voltage terminal, second load means coupled between said second node and said second voltage terminal, third and fourth field effect transistors of a second conductivity type having gates and drains cross-coupled at said first and second nodes and commonly connected sources, switching means coupled between the commonly connected sources of said third and fourth field effect transistors and said second voltage terminal, a first output terminal, a second output terminal, means for connecting said first output terminal to said first node and means for connecting said second output node to said second node, and control means for making said switching means non-conducting for a first period and conducting for a second period subsequent to said first period, wherein said constant current is divided into said first and second load means during said first period, and divided into said first and second load means and said third and fourth field effect transistors during said second period.

4,511,811

CHARGE PUMP FOR PROVIDING PROGRAMMING VOLTAGE TO THE WORD LINES IN A SEMICONDUCTOR MEMORY ARRAY

Anil Gupta, Sunnyvale, Calif., assignor to Seeq Technology, Inc., San Jose, Calif.

Filed Feb. 8, 1982, Ser. No. 346,891
Int. Cl.³ H03K *19/094, 19/20, 4/02;* **G11C** *8/00*
U.S. Cl. 307—463 **1 Claim**

1. An apparatus for selectively increasing the voltage on one or more of a plurality of conductive lines having inherent distributed capacitance disposed in a semiconductor circuit comprising:

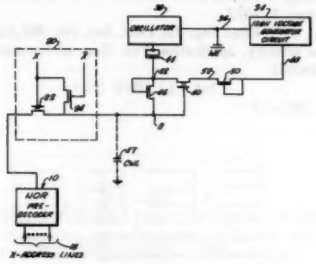
means disposed on said semiconductor circuit for selecting one or more of said conductive lines;

high voltage generating means disposed on said semiconductor circuit for generating a high voltage from a lower voltage power supply connected to said semiconductor circuit;

voltage pulse generating means disposed on said semiconductor circuit for generating voltage pulses;

means for capacitively coupling voltage pulses from said voltage pulse generating means to a voltage node in said semiconductor circuit;

transfer means responsive to said selecting means and connected to said voltage node for transferring increments of charge from said high voltage generating means to the inherent distributed capacitance in selected ones of said conductive lines in response to said voltage pulses;



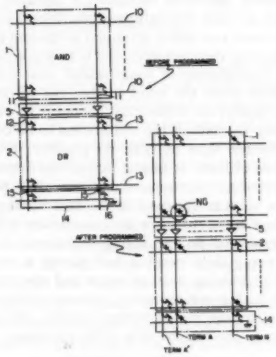
said transfer means including switching means cooperating with said selecting means for blocking substantially all of the flow of current through and transfer of charge from said high voltage generating means to said conductive lines which are unselected.

4,511,812

PROGRAMMABLE LOGIC ARRAY, INCLUDING AN ARRANGEMENT FOR INVALIDATING FAULTY AND TERM OUTPUTS

Shozo Satake, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 15, 1982, Ser. No. 388,620
Claims priority, application Japan, Jun. 24, 1981, 56-96666
Int. Cl.³ G06F *11/20, 11/22;* **G11C** *29/00*
U.S. Cl. 307—465 **5 Claims**



1. A programmable logic array comprising:

an AND array having a plurality of first input lines and a plurality of first output lines as AND terms, said AND array being programmed by electrically connecting selected ones of said first input lines and selected ones of said first output lines;

an OR array having a plurality of second input lines connected to corresponding ones of said first output lines and a plurality of second output lines, said OR array being programmed by electrically connecting selected ones of said second input lines and selected ones of said second output lines; and

invalidating means for selectively connecting said first output lines forming said AND terms or said second input lines to a constant potential source.

4,511,813

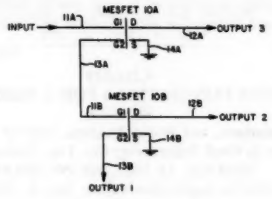
DUAL-GATE MESFET COMBINER/DIVIDER FOR USE IN ADAPTIVE SYSTEM APPLICATIONS

Jing-Jong Pan, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 273,046, Jun. 12, 1981, abandoned. This application Sep. 15, 1983, Ser. No. 532,520

Int. Cl.³ H03F *3/193;* **H03G** *3/30*

U.S. Cl. 307—501 **27 Claims**



1. A signal coupling device comprising:

an input terminal to which an input signal to be divided into a plurality of output signals is to be coupled;

a plurality of N output terminals from which respective ones of said output signals are to be derived; and

a plurality of (N−1) dual-gate MESFETs, each having first and second gate electrodes, a source electrode and a drain electrode; and wherein

the drain-source current path of each of said dual-gate MESFETs is connectable to a source of operating potential through a current conducting element;

the first gate electrode of the first of said plurality of MESFETs is coupled to said input terminal;

the first gate electrode of the second through $(N-1)^{th}$ MESFETs is coupled to the second gate electrode of the first through $(N-2)^{th}$ MESFETs, respectively;

the second gate electrode of the $(N-1)^{th}$ MESFET is coupled to the N^{th} output terminal; and

said first through $(N-1)^{th}$ output terminals are respectively coupled to one of the source and drain electrodes of said first through $(N-1)^{th}$ MESFETs, respectively; and

where N is an integer greater than two.

4,511,814

SEMICONDUCTOR ANALOG SWITCH CIRCUIT WITH COMPENSATION MEANS TO MINIMIZE OFFSET OF OUTPUT VOLTAGE

Kenji Matsuo, Yokohama, and Eiji Masuda, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 29, 1982, Ser. No. 445,038

Claims priority, application Japan, Nov. 30, 1981, 56-192251

Int. Cl.³ H03K *17/16, 17/693, 19/096*

U.S. Cl. 307—572 **4 Claims**

1. A semiconductor analog switching circuit device with a circuit for compensating an offset of an output voltage comprising:

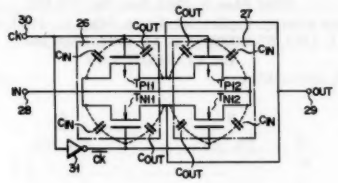
switching means including a first MOS transistor of a first channel type and a second MOS transistor of a second channel type having their channels connected in parallel and having first and second parallel junctions;

an input terminal for receiving an input signal connected to one of said parallel junctions of said first and second transistors;

an output terminal for providing an output signal connected to the other of said parallel junctions of said first and second transistors;

first control terminal for receiving a first control signal connected to the gate of said first transistor;

second control terminal for receiving a second control signal connected to the gate of said second transistor; and



compensating means for compensating an offset of said output signal including a third MOS transistor of said first channel type and a fourth MOS transistor of said second channel type having their channels connected in parallel, the compensating means and said switching means being connected in parallel, the gates of the third and fourth transistors being connected to said first and second control terminals, respectively.

4,511,815

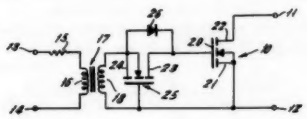
TRANSFORMER-ISOLATED POWER MOSFET DRIVER CIRCUIT

Peter N. Wood, Los Angeles, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Aug. 15, 1983, Ser. No. 523,121

Int. Cl.³ H03K *17/687, 17/04, 17/60, 17/68*

U.S. Cl. 307—584 **8 Claims**



1. A driver circuit for an output metal oxide field effect transistor; said output metal oxide field effect transistor having gate, source and drain electrodes; said driver circuit comprising an isolation transformer having magnetically coupled input winding means and output winding means which are dielectrically isolated from one another, a control metal oxide field effect transistor having gate, source and drain electrodes, and diode means connected across said source and drain electrodes of said control transistor; said output winding means; said source and drain electrodes of said control transistor and said gate and source electrodes of said output transistor connected in a closed series circuit; said output winding means, said gate electrode of said control transistor and said source electrode of said control transistor connected in a closed series circuit; said diode means having a conduction direction to permit charging of the inherent gate capacitance of said output transistor when said output winding means has an output voltage thereon of a first polarity, and to oppose the discharge of said gate capacitance when said output voltage of said output winding means is zero or reverses from said first polarity.

4,511,816

SURFACE ACOUSTIC WAVE DEVICE USING AN ELASTIC SUBSTRATE AND AN ALUMINUM NITRIDE PIEZOELECTRIC FILM

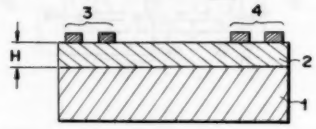
Nobuo Mikoshiba; Kazuo Tsubouchi, and Kazuyoshi Sugai, all of Sendai, Japan, assignors to Nobuo Mikoshiba and Kazuo Tsubouchi, both of Sendai, Japan

Filed Mar. 9, 1983, Ser. No. 473,410

Claims priority, application Japan, Mar. 11, 1982, 57-39238; Mar. 11, 1982, 57-39239; Mar. 11, 1982, 57-39240

Int. Cl.³ H03H *9/44*

U.S. Cl. 310—313 A **45 Claims**



1. In a surface acoustic wave device comprising an elastic substrate, an aluminum nitride (AlN) layer deposited on said elastic substrate, and electrodes provided on said AlN layer for converting an electric signal to a surface acoustic wave and vice versa, respectively, said elastic substrate having the property that its temperature coefficient of delay to the surface acoustic wave is positive, and said aluminum nitride layer having an orientation of the piezoelectric axis thereof so that its temperature coefficient of delay to the surface acoustic wave is negative.

4,511,817

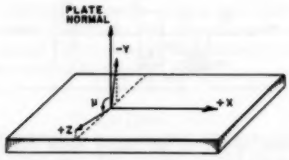
TEMPERATURE COMPENSATED ORIENTATION OF BERLINITE FOR SURFACE ACOUSTIC WAVE DEVICES

Bruce H. Chai, Bridgewater, N.J.; Dana S. Bailey, Columbia, Md.; John F. Vetelino, Veazie, Me.; Donald L. Lee, Orono, Me., and Jeffrey C. Andle, Bangor, Me., assignors to Allied Corporation, Morris Township, N.J.

Filed Oct. 28, 1983, Ser. No. 546,676

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—313 A **3 Claims**



1. a berlinite single crystal having a substantially planar surface defined by the Euler angles λ=about 0°; μ=about 85°; and θ=about 0°.

4,511,818

PIEZOELECTRIC GENERATOR DRIVEN BY A COMBUSTION ENGINE

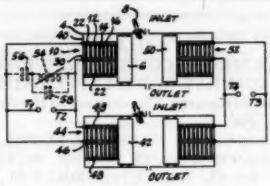
James A. Benjamin, Waukesha, and Herman P. Schutten, Milwaukee, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 22, 1982, Ser. No. 452,353

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—338 **3 Claims**

1. A piezoelectric generator comprising a combustion engine having a piston driven by explosion of a fuel mixture, and piezoelectric transducer means responsive to piston movement to generate a voltage, and comprising auxiliary energy storage means connected to said piezoelectric transducer means for



storing energy in response to said piston movement and for releasing said energy for return piston movement.

4,511,819

ELECTRODE CONNECTIONS FOR A PIEZOELECTRIC SENSOR

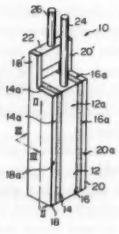
Naoki Matsubara, and Hideo Numata, both of Tokyo, Japan, assignors to Oval Engineering Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1983, Ser. No. 534,915

Claims priority, application Japan, Oct. 4, 1982, 57-173250

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—340 **3 Claims**



1. A piezoelectric sensor comprising, in combination:

two piezoelectric elements each having end faces and two side faces;

a first plate electrode having end faces and two side faces, one of said side faces of said first plate electrode being bonded to one side face of one of the piezoelectric elements and the other side face of said first plate electrode being bonded to one side face of the other piezoelectric element;

a second plate electrode bonded to the other side face of said one of the piezoelectric elements;

a third plate electrode bonded to the other side face of said other piezoelectric element;

said second and third plate electrodes each having parts thereof formed as output pickup sections which are integral extensions of the respective second and third plate electrodes, said first plate electrode and said two piezoelectric elements having a first generally common planar end face, said integral extensions extending beyond said first planar end face;

a metal fixture connected to said output pickup sections of the second and third plate electrodes to commonly pick up outputs of the second and third plate electrodes, said metal fixture being spaced from said first planar end face, said metal fixture and said integral extensions having a second generally common planar end face;

a first rod electrode connected to the end face of said first plate electrode which forms part of said first common planar end face;

a second rod electrode connected to the end face of the

metal fixture which forms part of said second common planar end face; and

two cover members for respectively covering the end faces of the two piezoelectric elements which are exposed to the outside of the sensor and predetermined areas of the end faces of the first, second and third plate electrodes adjacent to said end faces of the piezoelectric elements, each of said cover members being made of a highly insulative ceramic material to prevent current leakage.

4,511,820

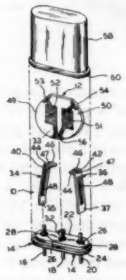
BIASED HOLDER FOR A CRYSTAL WAFER

Keith W. MacKenzie, Lindenhurst, Ill., assignor to Netcom, Inc., Northbrook, Ill.

Filed Oct. 19, 1983, Ser. No. 543,414

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—353 **14 Claims**



1. A piezoelectric crystal device comprising:

a crystal wafer;

a holder including a base and a pair of spaced apart arms secured to the base at the lower end thereof and extending outward therefrom, each of the arms comprising a body portion and a fork portion at the outer end of the body portion;

a slot formed in the body portion of each of said arms, said slot having an upper edge, a lower edge and side edges;

said fork portion including a slit separating a pair of prongs, the width of the slit being less than the width of the slot; and

a support member extending outward from the base and positioned between the arms, said arms being spreadable away from each other from a normal position to an outer position for inserting said crystal between the arms and in association with the support member, said wafer being operatively received in said slit and slot of each of said arms and the upper edges of the slots abutting adjacent edges of the wafer for retaining the wafer in the holder.

4,511,821

SUPPORT STRUCTURE FOR PIEZOELECTRIC VIBRATOR

Takeshi Nakamura, Uji; Hiroshi Nishiyama, Muko; Satoshi Matsuda, Otokuni, and Ikuo Matsumoto, Takatsuki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Nov. 4, 1983, Ser. No. 548,869

Claims priority, application Japan, Nov. 27, 1982, 57-179564[U]

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—354 **13 Claims**

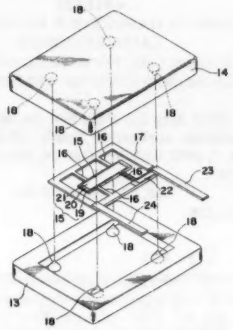
1. A vibrator support structure, comprising:

a pair of identical confronting casing halves;

a pair of sets of projections having bases and tips deformable toward said bases, fixed at said bases to respective ones of said pairs of casing halves, the projections of each set being in confronting relation to respective corresponding projections of the other set;

a vibrator having at least two metallic conductors;

a support framework having paired connecting elements connecting to said vibrator at nodes of vibration thereof, supporting said vibrator through said connecting elements between said pair of casing halves, said framework supporting said at least two conductors on different portions thereof and having means for electrically insulating said at least two conductors from each other;



at least two metallic terminal members electrically connected with respective ones of said metallic conductors for external electrical connection, one of said vibrator and said support framework being sandwiched at the associated nodes of vibration thereof between said tips of said projections of said two sets of projections; and

means for holding said pair of casing halves together with said terminal members clamped to said respective at least two conductors between said tips of some confronting projections of said sets of projections so as to electrically connect said conductors and said terminal members.

4,511,822

IMAGE DISPLAY TUBE HAVING A CHANNEL PLATE ELECTRON MULTIPLIER

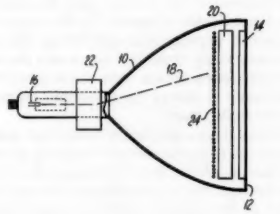
Derek Washington, Wallington, and Roger Pook, East Grinstead, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 3, 1981, Ser. No. 326,867

Claims priority, application United Kingdom, Dec. 19, 1980, 8040798

Int. Cl.³ H01J *31/48, 43/28*

U.S. Cl. 313—400 **6 Claims**



1. A display tube comprising an envelope having a faceplate and containing a screen parallel to an inner surface of the faceplate, an electron beam producing means for directing an electron beam at the screen, and a channel plate electron multiplier spaced from the screen and having an input side facing the electron beam producing means and an output side facing

the screen, said channel plate electron multiplier comprising a plurality of apertured dynodes having their apertures aligned to form electron multiplying channels,

characterized in that the display tube further includes a grid, spaced from the input side of the channel plate electron multiplier, for producing an electric field which inhibits secondary electrons emitted from said input side, after impingement by the electron beam, from straying transversely to remote channels.

4,511,823

REDUCTION OF HARMONICS IN GAS DISCHARGE LAMP BALLASTS

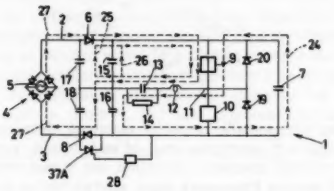
William L. Eaton, 6 Colin Grove Berea, and Alan B. Murray, 304 S. Ridge Rd., both of Durban 4001 Natal Province, South Africa

Filed May 27, 1983, Ser. No. 498,916

Claims priority, application South Africa, Jun. 1, 1982, 82/3819; Jul. 7, 1982, 82/3968; Oct. 26, 1982, 82/7811; Nov. 26, 1982, 82/8709

Int. Cl.³ H05B *37/02*

U.S. Cl. 315—226 **21 Claims**



1. A gas discharge lamp ballast including capacitor smoothing means for a rectified supply input, and switching devices for switching an output alternately between the positive and negative input supply lines in alternate positive and negative cycles, there being a finite time between each of the said switchings of the output during which the switching devices are off, said ballast comprising:

a load circuit having an inductive element connected to be driven in series from the said output and being adapted to have a gas discharge lamp load driven thereby;

switching control means associated with the switching devices for switching the devices considerably faster that the half cycle frequency of the rectified supply; a return path for the rectified input between the load circuit and a supply line;

control capacitor means connected to be charged in series with the load circuit, during on times of a switching device, by discharge from the smoothing capacitor means, to cause a lowering of the voltage over the load circuit;

a uni-directional device connected in the supply line of the return path to prevent discharge along that supply line from the smoothing capacitor means into the return path;

a path for conducting charge from the inductive element in the load circuit to charge the smoothing capacitor means during said finite times;

the uni-directional device also being connected, and the return path being adapted, to enable the said lowering of voltage over the load to allow a current flow originating from the rectified input to pass through the return path and the load circuit; and

the magnitude of the control capacitor means being proportioned, for a given load, to cause, sufficient of the said current flow originating from the rectified supply so as to provide, together with any other current flow through the load circuit, excluding such flow resulting from discharge of the smoothing capacitor means at least all the circuit losses and anticipated load loss, and thereby cause the voltage over the smoothing capacitor means to remain at least as high as the peaks of the rectified supply voltage.

4,511,824

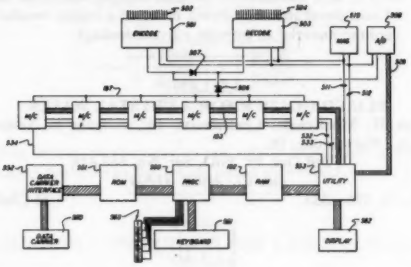
PARALLEL ACCESS MEMORY LIGHTING SYSTEM

Robert M. Goddard, 330 First Ave., New York, N.Y. 10009

Filed Jul. 15, 1983, Ser. No. 514,305

Int. Cl.³ G05F *1/00*; H05B *37/02*

U.S. Cl. 315—297 **17 Claims**



1. In a lighting control console for providing control outputs to dimmers for each of a plurality of channels, said console including a digital memory for storing intensity valves for each of said channels for each of a plurality of presets and means for preset mastering of intensity values by multiplying the channel intensity valves for each preset by a master value for that preset, and means for selecting the highest mastered intensity for each channel and providing it as the control output for that channel, the improvement comprising:

(a) a plurality of preset faders, one for each available preset, each providing an output proportional to the mechanical setting of said fader;

(b) the preset mastering means comprising a plurality of hardware multipliers

(c) means for transferring channel intensity values to said multipliers including:

i. a bus coupled to said memory;

ii. means to provide said channel intensity values for a given channel in the available presets as serial outputs to said bus from said memory; and

iii. means for distributing said serial outputs to said multipliers;

(d) means for comparing the outputs of all of said multipliers and providing the highest as the channel output;

(e) means, between said memory and said comparators, for converting digital outputs from said memory to analog form; and

(f) means for insuring that the outputs of all said multipliers are maintained at the input of said comparator for a time sufficient to perform a comparison.

4,511,825

ELECTRIC WHEELCHAIR WITH IMPROVED CONTROL CIRCUIT

Robert G. Klimo, Parma, Ohio, assignor to Invacare Corporation, Elyria, Ohio

Continuation-in-part of Ser. No. 254,443, Apr. 15, 1981, Pat. No. 4,387,325. This application Feb. 24, 1982, Ser. No. 351,990

Int. Cl.³ B62D *11/04*

U.S. Cl. 318—67 **12 Claims**

1. A plural motor speed control system for an electric vehicle comprising:

an electric power supply;

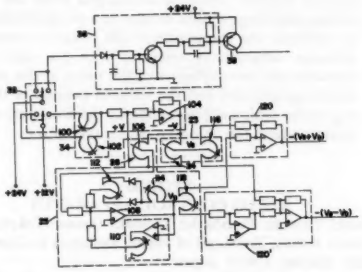
at least one left motor for driving a left vehicle wheel and at least one right motor for driving a right vehicle wheel, the vehicle speed being controlled by the speed of the left and right motors and vehicle direction being controlled by the relative speed of the left and right motors;

a joystick means connected with a speed control means for producing a single selected vehicle speed signal which varies with a selected vehicle speed and connected with a

separate vehicle direction control means for producing a single selected vehicle direction signal which varies with a selected deviation in vehicle direction from straight;

a first combining means for combining the selected vehicle speed signal and the selected vehicle direction signal to produce a right motor speed signal;

a second combining means for combining the selected vehicle speed signal and the selected vehicle direction signal to produce a left motor speed signal;



a right motor speed control circuit operatively connected with the power supply, right motor, and the first combining means for controlling the right motor speed in accordance with the right motor speed signal; and,

a left motor speed control circuit operatively connected with the power supply, left motor, and the second combining means for controlling the left motor speed in accordance with the left motor speed signal.

4,511,826

CONTROL APPARATUS FOR METAL SAW CUTTER

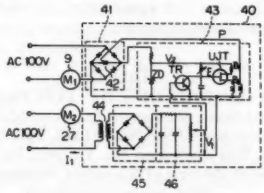
Takashi Kouchi, Nara, and Eiki Tamaoki, Higashiosaka, both of Japan, assignors to Rex Industries Co., Ltd., Osaka, Japan

Filed Dec. 13, 1983, Ser. No. 561,089

Claims priority, application Japan, Dec. 18, 1982, 57-221122

Int. Cl.³ H02P *5/46*

U.S. Cl. 318—98 **3 Claims**



1. An apparatus for cutting plastic coated metal cylindrical members having a first drive for rotating the cylindrical member to be cut, and a second stationary drive for rotating a saw blade independently of said first drive, said drives both rotating about separate and distinct axis, means for continuously detecting the cutting resistance of said second drive in terms of its electrical output and means for controlling the speed of said first drive in response to said detecting means for adjusting said speed to maintain the cutting resistance at a predetermined optimum level throughout the cutting operation.

4,511,827

APPARATUS FOR DRIVING A POLYPHASE BRUSHLESS MOTOR WITH A SUPPRESSED TORQUE RIPPLE

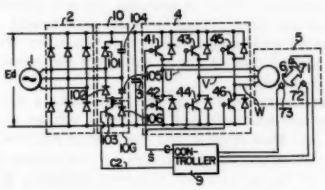
Shigeki Morinaga; Kunio Miyashita, both of Hitachi, and Yasuyuki Sugiura, Takahagi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 3, 1982, Ser. No. 404,646

Claims priority, application Japan, Aug. 3, 1981, 56-120734; Oct. 6, 1981, 56-158087

Int. Cl.³ H02P *7/28*

U.S. Cl. 318—254 **14 Claims**



1. An apparatus for driving a polyphase brushless motor with a suppressed torque ripple, said brushless motor having a rotor, the apparatus comprising:

sensor means for detecting the angular position of the rotor of said brushless motor;

a controller responsive to the output of said sensor means for generating a control signal containing trains of pulses for each phase of said motor; and

an inverter subject to commutation under control of said control signal from said controller for effecting switching among motor phase electric currents to selectively conduct electric current from a power source to each phase of said motor on the basis of said pulse trains;

wherein said controller includes means for increasing the value of integration of the electric current for each phase of said motor with respect to time between two instants of successive commutation for said motor phase electric current switching.

4,511,828

D.C. COMMUTATORLESS ELECTRIC MOTOR

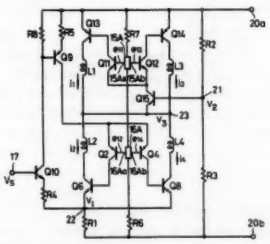
Kinzo Wada, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Jan. 20, 1983, Ser. No. 459,222

Claims priority, application Japan, Jan. 22, 1982, 57-8487

Int. Cl.³ H02P *6/02;* **H02K** *29/02*

U.S. Cl. 318—254 **2 Claims**



1. A D.C. commutatorless electric motor comprising:

a rotor having a permanent magnet;

first and second power source terminals for receiving a D.C. power supply;

first and second Hall elements for detecting rotational angle

of said rotor according to a magnetic field formed by the permanent magnet of said rotor, the first and second Hall elements and resistors being connected in series between the first and second power source terminals;

first and second pairs of stator coils for rotating said rotor;

a first pair of switching elements each having a control electrode and being coupled between, one terminal of said first pair of stator coils which generate counter electromotive forces of mutually opposite polarities, and the first power source terminal, other terminal of said first pair of stator coils being commonly coupled to one terminal of said second pair of stator coils which generate counter-electromotive forces of mutually opposite polarities;

a second pair of switching elements each having a control electrode and being coupled between, other terminal of said second pair of stator coils, and the second power source terminal;

first impedance control circuit comprising a first pair of transistors each coupled between a voltage terminal of said first Hall element and the control electrode of said first pair of switching elements, for controlling ON-OFF state of the first pair of switching elements, and a first impedance control means coupled between said first pair of transistors and the commonly coupled terminals of the stator coils, for controlling impedances of said first pair of switching elements upon ON state thereof through said first pair of transistors in response to a difference between a predetermined potential and a potential at the commonly coupled terminals of the stator coils so that the potential at the commonly coupled terminals of the stator coils is held at a substantial center of potentials at the first and second power source terminals; and

second impedance control circuit comprising a second pair of transistors each coupled between a voltage terminal of said second Hall element and the control electrode of said second pair of switching elements, for controlling ON-OFF state of the second pair of switching element, and a second impedance control means coupled to said second pair of transistors, for controlling impedances of said second pair of switching elements upon ON state thereof through said second pair of transistors in response to a control signal.

4,511,829

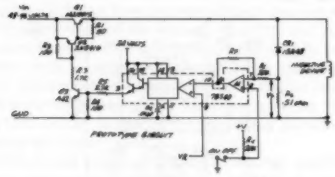
DIRECT CURRENT CONTROL IN INDUCTIVE LOADS

Waldemar S. Wisniewski, Orangevale, Calif., assignor to Exploration Logging, Inc., Sacramento, Calif.

Continuation of Ser. No. 169,764, Jul. 17, 1980, abandoned. This application Oct. 22, 1982, Ser. No. 436,043

Int. Cl.³ G05B *5/00;* **H02K** *27/20;* **H01H** *47/32*

U.S. Cl. 318—317 **12 Claims**



1. A current regulator comprising:

(a) a source of direct current power,

(b) an inductor for supplying electromagnetic energy to a mechanical load;

(c) switching means for supplying power from the source of direct current power to the inductor,

(d) means for actuating said switching means to apply electric current from the source to the inductor for predetermined fixed periods of time during all charging cycles, so that the charging cycles are of fixed time duration irrespective of changes in the load or of changes in the voltage of the source of direct current power,

(e) means for discharging electric current from the inductor during periods of time constituting discharging cycles intermediate the charging cycles, and

(f) sensing means responsive to the electric current which is discharged from the inductor during each discharging cycle for actuating said switching means to apply electric current from the source to the inductor to initiate a charge cycle and to terminate each discharge cycle when the electric current which is discharged from the inductor during discharge cycles decays to a predetermined value to maintain the magnitude of the electric current in the inductor substantially constant with the value varying between the narrow limits of the value at the end of the discharging cycles and the value at the end of the charging cycles which is determined by the fixed period of time during which the charging cycles take place.

4,511,830

SERVO CONTROL APPARATUS

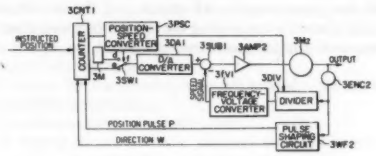
Yasuaki Yamada, Funabashi; Toshiaki Ozawa, Tokyo, and Hiroatsu Kondo, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 69,927, Aug. 27, 1979, Pat. No. 4,315,200. This application Jul. 23, 1981, Ser. No. 285,922

Claims priority, application Japan, Aug. 29, 1978, 53-105149; Sep. 20, 1978, 53-115648; Sep. 20, 1978, 53-115649; Sep. 20, 1978, 53-156650; Sep. 20, 1978, 53-115651

Int. Cl.³ H02P *5/00*

U.S. Cl. 318—318 **14 Claims**



1. A speed servo control apparatus, comprising:

signal generating means for providing a pulse train of a frequency proportional to a speed of a displacing body;

frequency dividing means for dividing the frequency of said pulse train;

changing means for changing the dividing ratio of said frequency dividing means; and

means for comparing output signals from said frequency dividing means with a predetermined value and for generating speed control signals.

4,511,831

SPEED CONTROL OF A D.C. ELECTRIC MOTOR

Stirling A. McInnis, 661 Kenyon St., Troy, Mich. 48084

Continuation-in-part of Ser. No. 251,865, Apr. 7, 1981, Pat. No. 4,346,335. This application Jun. 11, 1982, Ser. No. 387,506

The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.

Int. Cl.³ H02P *5/06*

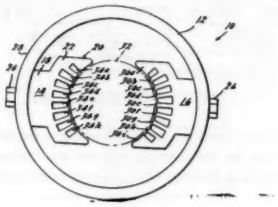
U.S. Cl. 318—351 **28 Claims**

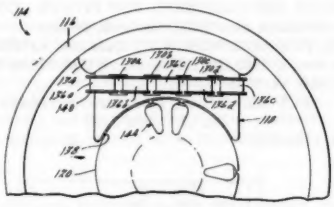
1. A. D.C. electric motor stator assembly, comprising:

a yoke member; and

at least one pair of opposing pole means associated with said yoke member for generating a magnetic field which is variable across a face portion of said pole means, each of said pole means including a plurality of separately excitable field control coils for selectively varying the density and direction of the magnetic flux along said face portion of said pole means; said pole means includes a field pole member having a shank portion mounted to said yoke

member, a plurality of spaced, generally radially extending field pole leg members associated with said face portion, and a core portion interposed radially between said shank portion and said face portion for providing a magnetic path between said shank portion and said face portion, and a field coil wound around said shank portion; and wherein said field control coils are wound individually around said field pole leg members; wherein said core portion of said field pole members has sufficient radial





depth to permit the magnetic flux in said field pole members to shift across said face portion when one or more of said field control coils are energized magnetically subtractive to the flux generated by said field coils, such that said magnetic flux generated by said field coils is shifted away from said substractively energized field control coil(s) and concentrated in a predeterminable portion of said field pole face portion; wherein said face portion is constructed to provide for a continuous, generally cylindrical surface as the bore for receiving said armature.

4,511,832

STEPPER MOTOR DOOR CONTROL APPARATUS AND METHOD

William E. Schmitz, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

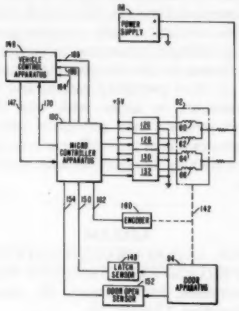
Filed Mar. 19, 1984, Ser. No. 590,109
Int. Cl.[3] H02K *29/04*
U.S. Cl. 318—685 **8 Claims**

1. In door movement control apparatus for providing movement of at least one door to a desired position in accordance with an input movement request signal and providing a desired speed pattern for that movement, the combination of

stepper motor means coupled with the door for moving the load in at least one direction,

sensor means coupled with the door for providing a door movement indicating signal, and

means coupled with said stepping motor and responsive to said movement request signal for providing a predetermined number of control pulses to energize the stepping motor for providing a movement of said door in said one direction, with the control pulse providing means being responsive to the door movement indicating signal and including a memory containing a desired time delay to determine a motor step taken in response to each control pulse and having a time duration established as a function of the number of control pulses previously provided to the



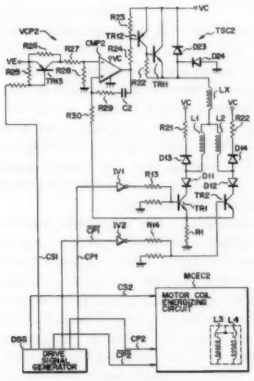
stepper motor for moving the door in said one direction and to establish said desired speed pattern.

4,511,833

STEPPING MOTOR DRIVING CIRCUIT

Yukio Kawaguchi, deceased, late of Shizuoka, Japan, and Nobuichi Kawaguchi, legal representative, Onoda, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1983, Ser. No. 531,655
Claims priority, application Japan, Nov. 10, 1982, 57-197068
Int. Cl.[3] H02K *29/04*
U.S. Cl. 318—696 **5 Claims**



1. A stepping motor driving circuit comprising:

a power supply terminal and a reference potential terminal;

at least one coil current control circuit having a switching circuit connected between each one end of a pair of motor coils and said power supply terminal, first resistive means, one end thereof being connected to said reference potential terminal, and first and second switching means which are respectively connected in series with said pair of motor coils between said switching circuit and the other end of said first resistive means;

energizing means for alternately turning on said first and second switching means;

a reference voltage generating means;

comparing means whose first and second input terminals are respectively connected to said reference voltage generating means and the other end of said first resistive means and which controls the conduction state of said switching

circuit in accordance with the voltages applied to said first and second input terminals; and

a series circuit of second resistive means and capacitive means connected between the output terminal and the second input terminal of said comparing means;

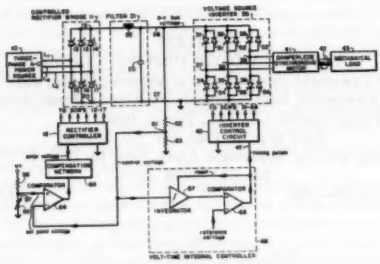
said reference voltage generating means comprising third switching means, third resistive means connected in parallel with said third switching means, and fourth resistive means connected in series with said third switching means, and wherein said reference voltage generating means generates one of two different reference voltages in accordance with the conduction state of said third switching means.

4,511,834

CONTROL AND STABILIZING SYSTEM FOR DAMPERLESS SYNCHRONOUS MOTOR

George H. Studtmann, Mt. Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 23, 1982, Ser. No. 452,559
Int. Cl.³ H02P 7/42
U.S. Cl. 318—700 **22 Claims**



1. A control system for controlling and stabilizing the operation of a damperless synchronous motor driven by the output a-c voltage developed by a voltage source inverter from an adjustable d-c bus voltage received over a d-c bus from a controlled d-c power supply having a low internal impedance, both the d-c bus voltage and the torque angle in the motor being subject to transient variations under transient conditions, said control system comprising:

means for establishing the amplitude and frequency of the inverter output voltage at desired steady state levels;

means for developing a control voltage which is a function of the d-c bus voltage or motor voltage and includes information indicating any sudden torque angle change;

and stabilizing means, controlled by said control voltage, for rapidly adjusting the inverter frequency anytime the torque angle tends to suddenly vary in order to reduce the extent to which the angle tends to change, thereby maintaining the torque angle relatively stable under transient conditions and within the stability limit of the motor.

4,511,835

VOLTAGE-CONTROLLED, INVERTER-MOTOR SYSTEM

George H. Studtmann, Mt. Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

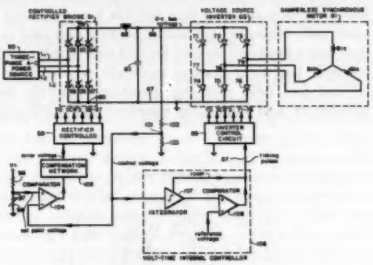
Filed Dec. 23, 1982, Ser. No. 452,560
Int. Cl.³ H02P 7/42
U.S. Cl. 318—700 **12 Claims**

1. A voltage-controlled, inverter-motor system, comprising:

a controlled d-c voltage source, having a relatively low internal impedance, for developing an adjustable d-c bus voltage;

a thyristor inverter having a series of thyristor switching devices and operated in response to said d-c bus voltage to develop an output a-c voltage;

means for establishing the amplitude and frequency of the inverter output a-c voltage at desired levels;



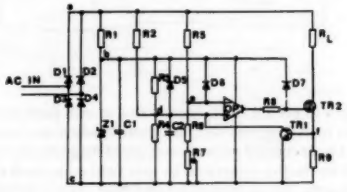
and a synchronous motor, having a leading power factor, driven by the inverter output a-c voltage, said thyristor switching devices being motor-commutated.

4,511,836

CIRCUIT ARRANGEMENT FOR POWER CONTROL

Bror A. Eriksson, Box 10022, Karlstad, Sweden

PCT No. PCT/SE82/00353, § 371 Date Jun. 9, 1983, § 102(e) Date Jun. 9, 1983, PCT Pub. No. WO83/01694, PCT Pub. Date May 11, 1983
PCT Filed Oct. 26, 1982, Ser. No. 511,163
Int. Cl.³ G05F 5/00
U.S. Cl. 323—300 **4 Claims**



1. Circuitry for maintaining constant the effect drawn by a load from an A.C. power source essentially independent of its voltage, comprising:

an operational amplifier having first and second inputs;

a power transistor in series with the load from the A.C. power source;

a feeding line carrying a feeding voltage of a sinusoidal, wave form;

means for applying a fraction of the voltage of the A.C. power source to the first input of the operational amplifier;

means for applying a reference voltage to the second input of the operational amplifier so that the reference voltage is raised and lowered when the feeding voltage is raised and lowered; and wherein

the operational amplifier is connected to the power transistor to control the power transistor, so that the transistor is made leading when and as long as the instantaneous value of said fraction of the feeding voltage is lower than a limiting value determined by said reference voltage; and so that the load is passed by periodic pulses of a curved form corresponding to that of the first and last parts of a sine half-wave next to the zero value and of a length which is greater or smaller depending upon whether said feeding voltage is lower or higher, respectively; and so that the energy contents of the pulses are maintained essentially constant over a wide range of feeding voltage variations.

4,511,837
MEASURING SYSTEM FOR MEASURING THE VARIATION OF THE CAPACITIVE IMPEDANCE OF A BEARING INSTALLED IN A HOUSING

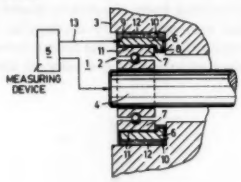
Karel N. Vermeiren, Woerden, and Hendrik Dolfsma, Nieuwegein, both of Netherlands, assignors to SKF Industrial Trading & Development Co., B.V., Netherlands

Filed Jun. 17, 1982, Ser. No. 389,000

Claims priority, application Netherlands, Jun. 30, 1981, 8103161

Int. Cl.³ G01R 27/26

U.S. Cl. 324—61 R **19 Claims**



8. A bearing comprising an inner ring, an outer ring, a plurality of rolling elements interposed between the rings, and an electrically conductive measuring ring, fittingly surrounding the outer ring, which measuring ring is coated with an insulating layer, wherein the portion of the insulating layer between the outer ring and the measuring ring is considerably thinner than the remaining portion of the insulating layer.

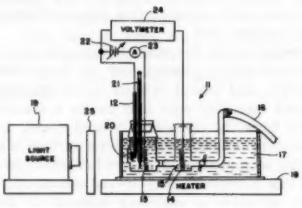
4,511,838
METHOD FOR DETERMINING THE POINT OF ZERO ZETA POTENTIAL OF SEMICONDUCTOR

Benjamin Reichman, Birmingham, Mich., and Charles E. Byvik, Hampton, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 31, 1982, Ser. No. 364,041

Int. Cl.³ G01N 27/02

U.S. Cl. 324—71.5 **4 Claims**



1. A method for obtaining the onset potentials at different temperatures of a semiconductor material comprising the steps of:

using the semiconductor material as the working electrode of a three-electrode photoelectrochemical cell including a counter electrode, a reference electrode, an electrolyte, a heater for controlling the temperature of the photoelectrochemical cell, and a light source for illuminating the working electrode;

measuring the temperature of said electrolyte at several different temperature levels;

for each temperature level measured, varying the potential between said working electrode and said counter electrode until there is zero current between the working electrode and the counter electrode; and

measuring the potential between said working electrode and said reference electrode whereby the measured potential is the onset potential corresponding to the measured temperature.

2. A method according to claim 1 including the step of determining the slope of a graph of measured onset potentials versus measured temperatures.

3. A method according to claim 2 including the step of using said slope to compute pH_{pzc} of the semiconductor material by substituting the slope for the term

$$\frac{\partial V_{FB}}{\partial T}$$

in the equation:

$$\frac{\partial V_{FB}}{\partial T} = \frac{2.3R}{F}\left(pH_{pzc} - \log_{10}\frac{n}{N_c}\right)$$

and computing pH_{pzc} where V_{FB} is the flatband potential of the semiconductor material, T is the temperature of the cell, n is the free carrier density, N_c is the density of states in the conduction band, R is the universal gas constant and F is Faraday's constant.

4,511,839
METHOD AND A SYSTEM FOR ANALYZING THE SECONDARY CURRENT IN A CURRENT TRANSFORMER, THE PRIMARY SIDE OF WHICH IS CONNECTED INTO A LINE OF AN ELECTRIC ENERGY SUPPLY NETWORK

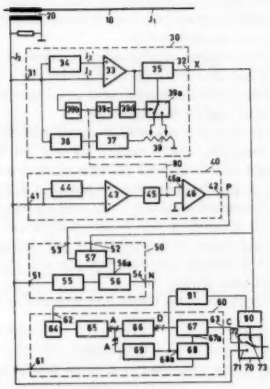
Paul Bulaty, Wettingen; Ivan De Mesmaeker, Windisch; Zdenek Franc, Gebenstorf, and Giuseppe Salerno, Untersiggenthal, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Mar. 22, 1983, Ser. No. 477,645

Claims priority, application European Pat. Off., Mar. 29, 1982, 82200381.0

Int. Cl.³ G01R 1/20

U.S. Cl. 324—127 **17 Claims**



1. A system for generating an analyzable current signal from the secondary current of a saturated transformer whose primary windings are connected to a line in an electric power supply network, comprising:

a saturation detector having an input connected to a secondary winding of the transformer;

a polarity detector having an input connected to said secondary winding;

an extrapolation circuit having a first input connected to said secondary winding;

a zero transition detector having a first input connected to said secondary winding, a second input connected to said saturation detector and a third input connected to said polarity detector, and an output connected to a second input of said extrapolation circuit; and

a switch having one input connected to said secondary winding and a second input connected to said extrapolation circuit, and being responsive to an output from said saturation detector for switching between said two inputs.

4,511,840

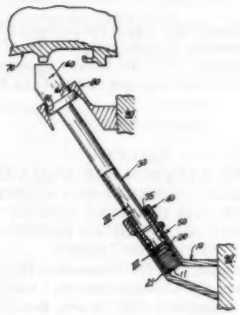
MOUNTING ASSEMBLY FOR A SPEED SENSOR

Earl A. Leach, Jr., Masonville, N.Y., assignor to Allied Corporation, Morristown, Morristownship, N.J.

Filed Jun. 28, 1982, Ser. No. 392,924

Int. Cl.³ G01P 3/42

U.S. Cl. 324—160 **2 Claims**



1. A mounting assembly for a speed sensor comprising:

a tubular housing having an internal shoulder therein;

a spring located in said housing, one end of said spring engaging the internal shoulder in said housing;

a bushing;

means for slideably mounting an end portion of said bushing in said housing so that one end of said bushing engages the other end of said spring;

means for sensing rotational movement of a member and providing an electrical signal that is a function of the rotational speed thereof, said sensing means mounted to the other end of said bushing;

a bracket spaced from said housing and mounted adjacent said member, said bracket having an opening therein through which an end portion of said sensing means extends so that said sensing means is in a fixed position at a predetermined distance from said member;

means for mounting said housing adjacent said bracket so that said other end portion of said housing having said sensor mounted thereto engages the bracket and compresses said spring; and

means for preventing rotational movement of said bushing.

4,511,841

METHOD AND APPARATUS FOR HIGH SPEED MAGIC ANGLE SPINNING

Victor J. Bartuska; David H. Lewis, both of Fort Collins; Robin B. Lewis, Bellvue, and David G. Dalbow, Fort Collins, all of Colo., assignors to Chemagnetics, Inc., Ft. Collins, Colo.

Filed Jun. 17, 1982, Ser. No. 389,449

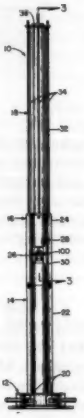
Int. Cl.³ G01R 33/08

U.S. Cl. 324—321 **31 Claims**

1. High speed sample spinning apparatus, comprising:

rotor means for spinning a sample, said rotor means having a first section in the shape of an elongated cylinder of uniform diameter along its entire length and a second section extending axially outwardly from one end of said cylindrical first section, said second section being tapered from a base at its proximal end to a point of convergence at its distal end on a line extending outward from the longitudinal axis of said cylindrical first section, said base of said tapered second section being the same diameter as said cylindrical first section;

spinning and axial end bearing means for imparting rotary motion to said rotor means and for supporting said tapered second section of said rotor means, said spinning and end bearing means being comprised of a bearing body having a cavity therein with an open end adapted to receive therein said tapered second section, and a plurality of ports in said bearing body adapted to direct jet streams of gaseous fluid into said cavity in angular spaced apart relation to each other around the circumference thereof in such a manner as to produce a vortical air flow in said



cavity, and a plurality of vanes in angular spaced apart relation to each other around the peripheral surface of said tapered second section adapted to impart rotational motion to said rotor means upon impact thereon by said vortical air flow; and

lateral bearing means for maintaining said rotor means in longitudinal axial alignment with the longitudinal axis of said cavity, said lateral bearing means including a ring positioned coaxially with said cavity a spaced distance outward from the open end of said cavity a sufficient distance to be around the peripheral surface of said cylindrical first section adjacent the end of said cylindrical first section that is opposite said tapered second section, and a plurality of ports in said ring adapted to direct a jet streams of gaseous fluid onto said cylindrical second section in spaced apart relation around the circumference thereof.

4,511,842

ELECTROMAGNETIC LOGGING DEVICE AND METHOD WITH DIELECTRIC GUIDING LAYER

James H. Moran, Spicewood, and Rama N. Rau, League City, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 13, 1981, Ser. No. 310,691

Int. Cl.³ G01V 3/18, 3/30

U.S. Cl. 324—338 **7 Claims**

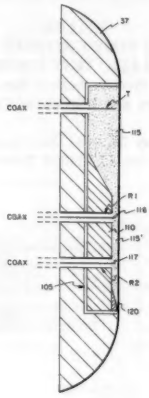
1. A logging device for determining properties of formations surrounding a borehole, comprising;

an elongated support with a wall-engagable member movable through the borehole;

a transmitter and a pair of spaced receivers mounted in spaced relation in said member;

a source of electromagnetic energy coupled to said transmitter;

a layer of dielectric material disposed on a surface of said member and covering said transmitter and receivers and the region therebetween, such that said layer can abut the wall of said borehole;, said layer having a dielectric constant that is greater than the expected dielectric constant



of surrounding formations to be investigated, said layer being operative to guide the electromagnetic energy travelling in the formations between the transmitter and the receivers; and

means for measuring characteristics of electromagnetic energy received at said receiver to determine properties of the surrounding formations.

4,511,843

ELECTROMAGNETIC LOGGING SONDE HAVING IMPROVED HOUSING

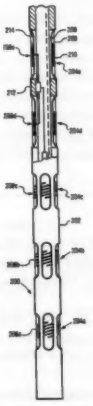
Yvon Thoraval, Le Plessis-Robinson, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 15, 1981, Ser. No. 311,801

Claims priority, application France, Oct. 17, 1980, 80 22327

Int. Cl.³ G01V *3/30*

U.S. Cl. 324—338 **11 Claims**



1. A mandrel apparatus for investigating a characteristic of a subsurface earth formation traversed by a borehole with propagatory electromagnetic energy, comprising:

a signal source having a preselected frequency of operation;

first magnetic dipole means coupled to said signal source, the frequency of operation of said signal source and the characteristics of said first magnetic dipole means being such as to provide for the transmission of propagatory electromagnetic energy into the earth formation;

a receiver circuit;

second magnetic dipole means coupled to said receiver circuit, the characteristics of said receiver circuit and said second magnetic dipole means being such as to provide for the detection of propagatory electromagnetic energy from the earth formation; and

a longitudinally elongated structural conductive housing member, said first and second magnetic dipole means being mounted thereon at respective longitudinal locations with the respective axes of said first and second magnetic dipole means being parallel to the longitudinal axis of said conductive housing member, and said conductive housing member being essentially continuously conductive both longitudinally and circumferentially and having a longitudinal portion between the respective locations of said magnetic dipole means that is uninsulated from the borehole.

4,511,844

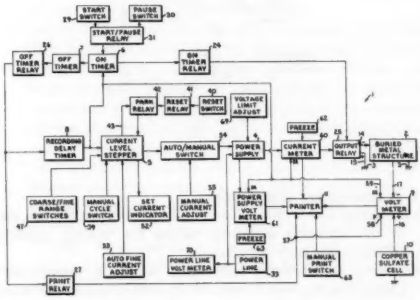
E-LOG I FIELD COMPUTER

Thomas N. Tietze, Kansas City, Mo., assignor to Panhandle Eastern Pipe Line Company, Kansas City, Mo.

Filed Dec. 10, 1982, Ser. No. 448,818

Int. Cl.³ G01N *27/42*

U.S. Cl. 324—425 **12 Claims**



1. An apparatus for acquiring data to determine the cathodic protection voltage requirement of a buried metal structure comprising:

(a) power supply means operatively connected to a buried metal structure and the ground in contact with said structure and operable to circulate electrical current therethrough;

(b) current stepper means operatively connected to said power supply means and operative to set one of a plurality of selected current levels for circulation by said power supply means and to advance to a next current level in response to a stepper advance signal;

(c) a current meter connected in a circuit loop including said structure, said ground, and said power supply means and operative to measure and indicate the level of the circulated current;

(d) volt meter means operatively connected between said structure and said ground and operative to measure a structure voltage of said structure relative to said ground corresponding to each level of said circulated current and to releasably retain said structure voltage in response to a voltage hold signal;

(e) a printer connected to said volt meter means and operative to print each value of said structure voltage which is retained by said volt meter means; and

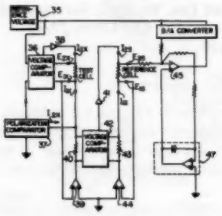
(f) timer means operatively connected to said power supply means, said current stepper means, said printer, and said volt meter means and operative to effect in a repeating sequence: the circulation of said current for an ON interval of selected duration; the interruption of said current for an OFF interval of selected duration; the provision of a voltage hold signal to said volt meter means to cause the retention of a structure voltage corresponding to the previously circulated current level and the printing of the retained structure voltage at the end of said OFF interval; the release of said volt meter means from retaining said structure voltage after the printing thereof; and the provision of said stepper advance signal to cause the advancement of said current stepper means to said next current level whereby a plurality of circulated current levels and corresponding structure voltage levels are obtained for plotting a graph to determine the cathodic protection requirements of said structure in said ground.

4,511,845

SALINOMETER

Thomas M. Dauphinee, and Christopher G. M. Kirby, both of Ottawa, Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Sep. 8, 1982, Ser. No. 416,013
Int. Cl.³ G01N *27/02*
U.S. Cl. 324—444 **8 Claims**



1. A salinometer comprising:

a reference water channel and a sample water channel, each of the channels including means for feeding predetermined water into the channel;

reference conductivity cell means in the reference water channel and sample conductivity cell means in the sample water channel each conductivity cell means having a water inlet and a water outlet, and each conductivity cell means having first, second, third and fourth electrodes immersed sequentially in the water in the direction of flow, the first and third electrodes being potential electrodes and the second and fourth electrodes being current electrodes;

means for maintaining the temperature of the water in the two cell means substantially the same;

first circuit means for controlling the current through each of the second electrodes such that the voltages at the first electrodes are maintained at a potential substantially identical to the voltage in the temperature maintaining means, thereby preventing electrical leakage from the water inlet of each cell;

second circuit means for driving a current through the fourth electrode of the sample water conductivity cell means thereby generating an ac voltage V_x between the first and third electrodes of the sample water conductivity cell means; and

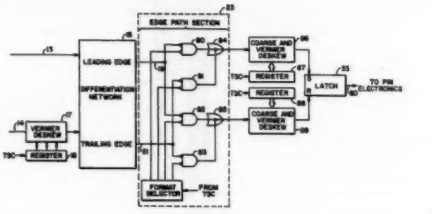
third circuit means for controlling the current through the fourth electrode of the standard water conductivity cell means such that the current in the second electrode of the standard water conductivity cell means has a fixed ratio to the current in the second electrode of the sample water conductivity cell means, whereby the conductivity ratio R_t between the reference water and the sample water is determined as a function of the voltage V_s between the reference cell means first and third electrodes and the voltage V_x between the sample cell means first and third electrodes.

4,511,846

DESKEWING TIME-CRITICAL SIGNALS IN AUTOMATIC TEST EQUIPMENT

Alex Nagy, and Dick Herlein, both of San Jose, Calif., assignors to Fairchild Camera and Instrument Corporation, San Jose, Calif.

Filed May 24, 1982, Ser. No. 381,617
Int. Cl.³ H03K *5/06*
U.S. Cl. 328—164 **8 Claims**



1. Apparatus for supplying deskewed signals comprising:

generating means for generating an electrical signal of desired duration, the signal including a leading edge and a trailing edge;

differentiation means coupled to the generating means for separating the electrical signal into a pair of signals, one of the pair being a leading edge signal and the other a trailing edge signal;

logic gate means connected to receive the pair of signals and to supply one of the pair of signals along a set path and the other of the pair of signals along a reset path;

set and reset time delay means, each connected to the corresponding path to delay the leading edge signal and the trailing edge signal respectively by desired times;

latch means connected to the set and reset time delay means to receive signals therefrom and form the electrical signal of desired duration;

control means coupled to the logic gate means for controlling to which of the set and reset paths each of the pair of signals is supplied; and

wherein the logic gate means includes a first pair of gates connected to receive the leading edge signal, and a second pair of gates connected to receive the trailing edge signal, one of each pair of gates being connected to the set time delay means, and the other of each pair to the reset time delay means.

4,511,847

FILTER ASSEMBLY FOR ELIMINATING MAINS DISTURBANCES

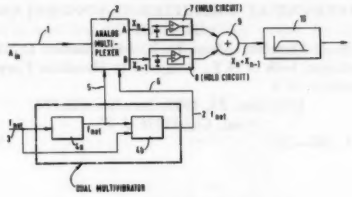
Börje Rantala, Helsinki, Finland, assignor to Instrumentarium Oy, Finland

Filed Jun. 17, 1982, Ser. No. 389,278
Claims priority, application Finland, Jun. 22, 1981, 811941
Int. Cl.³ H03B *1/04*
U.S. Cl. 328—167 **2 Claims**

1. A filter assembly for eliminating mains disburbances from an electric signal, especially a noise type of bioelectric signal, for analyzing amplitude, power or other intensity related parameter of the signal, comprising in combination:

sample and hold circuit means responsive to said electric signal for providing analogous discrete time samples from said electric signal by employing doubled mains frequency as the sampling frequency;

summing means responsive to said sample and hold circuit means for providing signals $Y_n = \frac{1}{2}(X_n + X_{n-1})$, wherein



X_n is a number n sample, from successive analogous samples for filtering away the mains frequency and its odd harmonic frequencies; and

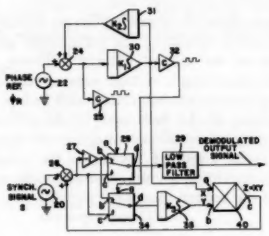
analog high pass filter means responsive to said summing means for processing said signals Y_n for filtering away the even harmonic frequencies of mains frequency downmixed by the sampling.

4,511,848

SYNCHRONOUS AM DEMODULATOR WITH QUADRATURE SIGNAL CANCELLATION

William S. Watson, Eau Claire, Wis., assignor to Watson Industries, Inc., Eau Claire, Wis.

Filed Jun. 15, 1983, Ser. No. 504,585
Int. Cl.³ H03D *1/04*
U.S. Cl. 329—50 **15 Claims**



1. A method of removing a quadrature error signal component from a synchronous signal in a synchronous AM demodulator network having a phase reference signal, comprising the steps of:

(a) generating a counteracting signal, phase related in stable manner to the system phase reference signal; and

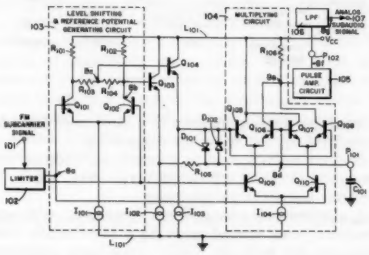
(b) mixing said counteracting signal with said synchronous signal, wherein said counteracting signal subtracts from the quadrature error signal component of said synchronous signal.

4,511,849

FM PULSE COUNTING DEMODULATOR WITH MULTIPLIER FOR INPUT AND DELAYED INPUT SIGNALS

Kozo Yoshihisa, and Isamu Okui, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Jun. 30, 1981, Ser. No. 279,078
Claims priority, application Japan, Jul. 3, 1980, 55-90940
Int. Cl.³ H03D *3/14, 3/04*
U.S. Cl. 329—103 **1 Claim**



1. An FM signal demodulating circuit employing a pulse counting technique, said circuit comprising:

a signal input terminal for receiving an FM signal;

a limiter having an input terminal and a pair of output terminals, said input terminal being coupled to said signal input terminal, one of said output terminals producing a first limited FM signal and the other input terminal producing a second limited FM signal having inverse phase with respect to said first limited FM signal;

a multiplying circuit comprising first, second, third, fourth, fifth and sixth transistors, the base electrode of said first transistor being connected to said other limiter output terminal, the base electrode of said second transistor being connected to said one of said limiter output terminals, the emitter electrodes of said first and second transistors being connected together, the collector electrode of said first transistor being connected to the emitter electrodes of said third and fourth transistors, the collector electrode of said second transistor being connected to the emitter electrodes of said fifth and sixth transistors, the base electrodes of said third and sixth transistors being connected together, the base electrodes of said fourth and fifth transistors being coupled to the output terminal of an integrating circuit, and the collector electrodes of said third and fifth transistors being connected together, said integrating circuit producing a time delay much less than $\pi/4$;

a low pass filter having an input terminal and an output terminal, said input terminal being coupled to the collector electrodes of said fourth and sixth transistors;

a level shifting and reference potential generating circuit having a pair of input terminals and a pair of output terminals, each input terminal being connected to a respective one of said limiter output terminals, one of said output terminals producing a reference potential and being connected to the base electrodes of said third and sixth transistors, and the other output terminal producing a level shifted FM signal and being coupled to an input terminal of said integrating circuit;

a first diode having its anode electrode coupled to said one of the output terminals of said level shifting and reference potential generating circuit and its cthode electrode connected to said integrating circuit output terminal; and

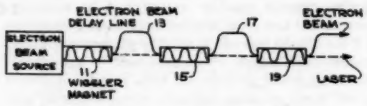
a second diode having its anode electrode connected to said integrating circuit output terminal, and its cathode electrode connected to said one of the output terminals of said level shifting and reference potential generating circuit.

4,511,850

SHORT PULSE FREE ELECTRON LASER AMPLIFIER

Leland G. Schlitt, Livermore, and Abraham Szoke, Fremont, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 26, 1982, Ser. No. 342,678
Int. Cl.³ H01S *3/09, 3/14*
U.S. Cl. 330—4.3 **3 Claims**



1. Apparatus for amplification of a short laser pulse of temporal duration τ_L, the apparatus comprising:

an electron beam source to produce an electron beam of temporal duration substantially $\tau_B = N\tau_L$, where N is a positive integer larger than one;

N wiggler magnets, arranged in a linear array, with adjacent magnets being spaced apart by a substantially constant distance and with the linear array being positioned to receive an electron beam produced by the electron beam source and to receive the laser pulse;

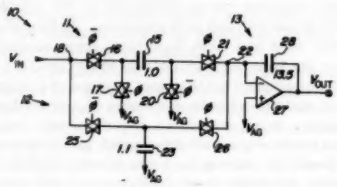
N−1 electron beam delay lines, with the k^{th} delay line (k=1, 2, . . . N−1) being positioned between the k^{th} and the $(k+1)^{th}$ wiggler magnet, with each delay line being arranged to delay an electron beam by a predetermined time interval of substantially τ_L, relative to a co-propagating light wave, as the electron beam moves from the k^{th} wiggler magnet to the $(k+1)^{th}$ wiggler magnet.

4,511,851

METHOD AND APPARATUS FOR OBTAINING SMALL FRACTIONAL UNITS OF CAPACITANCE

Henry Wurzburg, Round Rock, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 13, 1982, Ser. No. 449,357
Int. Cl.³ H03F *1/34*
U.S. Cl. 330—51 **10 Claims**



1. An amplifier circuit utilizing small fractional capacitance units, comprising:

operational amplifier means having an inverting input, a noninverting input and an output, for developing an output voltage;

capacitive feedback means coupled between the output and the inverting input of the operational amplifier means, and having a first predetermined capacitive value;

first switched capacitance means having an input coupled to an input terminal, and an output coupled to the inverting input of said operational amplifier means, said first switched capacitance means having a second predetermined capacitive value; and

second switched capacitance means having an input coupled to the input terminal, and an output coupled to the inverting input of said operational amplifier means, said second capacitance means having a third predetermined capacitive value which is a fractional percentage of said second predetermined capacitive value,

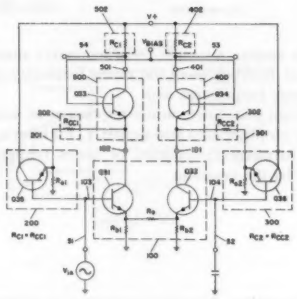
wherein said output voltage is proportional to the ratio of the second and third capacitive differential value to the first capacitive value.

4,511,852

DIFFERENTIAL AMPLIFIER HAVING BALANCED OUTPUT

Kenneth J. Henrich, Kings Park, and Thomas C. Hana, E. Patchoque, both of N.Y., assignors to Hazeltine Corporation, Commack, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,174
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—252 **15 Claims**



1. An apparatus comprising:

a. A differential amplifier having a gain with first and second inputs and first and second outputs;

b. A first voltage follower circuit having a first amplifier, said first circuit associated with the first input and having an output;

c. A second voltage follower circuit having a second amplifier, said second circuit associated with the second input and having an output;

d. First means for summing having inputs associated with the first output of the differential amplifier and the output of the first voltage follower circuit, and having an output providing a voltage substantially representing the sum of the outputs associated with its inputs;

e. Second means for summing having inputs associated with the second output of the differential amplifier and the output of the second voltage follower, and having an output providing a voltage substantially representing the sum of the outputs associated with its inputs, whereby the grounding of the first input of the differential amplifier and applying a positive voltage to the second input of the differential amplifier results in the output of the first means providing a voltage substantially equal to the output of the second means.

4,511,853

DIFFERENTIAL AMPLIFIER CIRCUIT HAVING IMPROVED CONTROL SIGNAL FILTERING

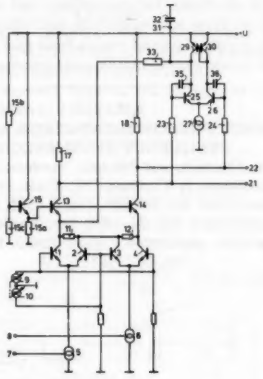
Karl H. Matthies, Hamburg, and Hartmut Harlos, Norderstedt, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,142
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213506
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—259 **5 Claims**

1. An integrated semiconductor circuit arrangement, which comprises:

a first differential amplifier having a differential input and a differential output, said output providing an alternating voltage output signal which is balanced with respect to ground and comprises a d.c. component and first and second alternating subvoltages with respect to ground;

means for filtering the alternating voltage from said d.c. component and amplifying said d.c. component, said means comprising first and second low-pass filters coupled to said first differential amplifier output for filtering said first and second alternating subvoltages, respectively,



and a second differential amplifier having first and second inputs coupled to said first and second low-pass filters, respectively, and to said first differential amplifier output, and an unbalanced output at which a d.c. control signal is generated; and

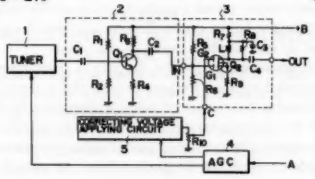
a third low-pass filter having an input coupled to the unbalanced output of said second differential amplifier and an output which is coupled back to said first differential amplifier to provide negative feedback to said first amplifier.

4,511,854

AUTOMATIC LINEARITY CORRECTING CIRCUIT

Toshio Kishida, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 472,736
Claims priority, application Japan, Mar. 11, 1982, 57-39237
Int. Cl.³ H03G *3/30*
U.S. Cl. 330—279 **4 Claims**



1. In a combination of an amplifying stage having a junction-type active element exhibiting a nonlinear transfer characteristic causing signal distortion increasing with signal level, a signal source coupled to the input of said amplifying stage, the output level of said signal source being controllably responsive to a gain control or first biasing signal coupled to said signal source, a dual-gate field-effect transistor element having a first gate thereof coupled to the output of said amplifying stage, and a backward-acting automatic gain control circuit including a signal level detection circuit responsively coupled to the output of said dual-gate element for providing said first biasing signal to said signal source responsively to the magnitude of the signal level output of said dual-gate element and generally increasing in strength therewith so as to maintain said dual-gate element output signal level at a substantially constant value, the improvement wherein:

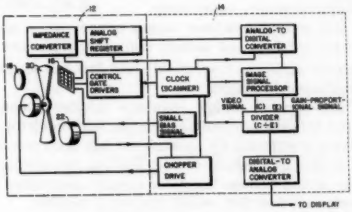
said automatic gain control circuit includes a linearity correcting voltage circuit responsively coupled to said detection circuit and coupled to provide a linearity correcting or second bias voltage to the second gate of said dual-gate element, said dual-gate element having a nonlinear transfer characteristic at said first gate generally complementary to that of said junction-type device and having the degree of nonlinearity controllably responsive to biasing voltage applied to said second gate, said correcting voltage having a relatively strong value for weak values of amplifying stage output signal level and a relatively weak value for strong amplifying stage output signal levels so as to control the nonlinearity of said dual-gate element to at least partially compensate for said nonlinear transfer characteristics of said junction-type active element.

4,511,855

COMPENSATION FOR DIFFERENCES IN GAIN AMONG AMPLIFIERS

Karl R. Wittig, New York, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Division of Ser. No. 358,541, Mar. 15, 1982, Pat. No. 4,481,477.
This application Mar. 26, 1984, Ser. No. 593,147
Int. Cl.³ H03G *3/20*; G01R *19/12*
U.S. Cl. 330—279 **9 Claims**



1. A method of actively compensating for differences in the small signal gain among two or more amplifiers, each of said amplifiers, in operation, producing a small signal output in response to a small signal input variation about a bias level input, said small signal input varying substantially linearly over a field time interval, said method comprising the steps of:

producing signals which are directly proportional to the small signal gains of the amplifiers, one gain-proportional signal being produced for each amplifier; and

dividing the small signal output of each amplifier by the signal proportional to the small signal gain of the amplifier;

characterized in that each gain-proportional signal is produced by a method comprising the steps of:

adding a small bias signal, ΔV, to the bias level input during a portion of the field time interval;

measuring the output of the amplifier at a first time during the field time interval to produce a first measured output, said first time being when the bias signal, ΔV, has not been added to the bias level input;

measuring the output of the amplifier at a second time during the field time interval to produce a second measured output, said second time being when the bias signal, ΔV, has been added to the bias level input;

measuring the output of the amplifier at a third time during the field time interval to produce a third measured output, said third time being different from the first and second times;

multiplying each measured output by a respective preselected fixed number to produce weighted measured outputs; and

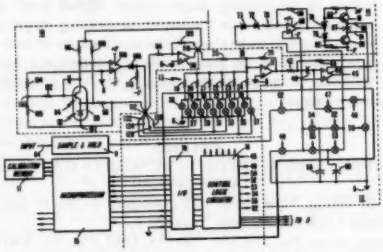
adding the weighted measured outputs in such a way that the sum is a signal which is directly proportional to the product of the bias signal, ΔV, with the small signal gain of the amplifier during the field time interval.

4,511,856

BOOTSTRAP POWER REGULATOR FOR SYSTEMS SUCH AS ANALOG TO DIGITAL CONVERTERS

Benjamin Eng, Jr., Everett, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Nov. 14, 1983, Ser. No. 551,642
Int. Cl.³ H03F 3/04
U.S. Cl. 330—297 **11 Claims**



1. A circuit connectable to first and second voltage sources for supplying to a first amplifier means first and second regulated supply voltages, comprising:

first and second transistor means connected in series between said first and second voltage sources and having outputs supplying respectively said first and second regulated supply voltages;

first and second voltage regulator devices connected in series between said voltage sources, said regulator devices having a substantially constant voltage drop as a function of at least a threshold current flowing therethrough, outputs of said voltage regulator devices controlling respectively said first and second transistor means;

a second amplifier means for controlling an input of said first and second regulator devices;

first means for applying an input signal to non-inverting inputs of said first and second amplifier means; and

second means for applying an output of said first amplifier means to an inverting input of said second amplifier means;

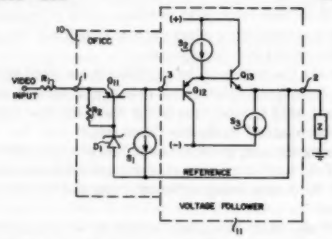
whereby the supply voltages track input signals applied to said second amplifier means to eliminate a common mode signal from the output of said first amplifier means.

4,511,857

OUTPUT FOLLOWING INTERMEDIATE CASCODE CIRCUIT

Steven J. Gunderson, 450 Daily Dr., #6, Camarillo, Calif. 93010

Filed Sep. 17, 1982, Ser. No. 419,161
Int. Cl.³ H03F 3/04
U.S. Cl. 330—311 **10 Claims**



1. A circuit combination for reducing nonlinear distortion comprising:

signal source means having an output terminal;

voltage follower output means having an input terminal and an output terminal;

isolation circuit means having an input terminal and an output terminal and including a transconductance means having a control electrode;

means connecting said signal source means output terminal to said isolation circuit means input terminal;

means connecting said isolation circuit means output terminal to said output means input terminal; and

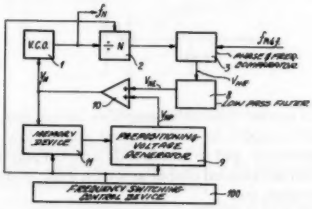
means connecting said output means output terminal to said control electrode for controlling said isolation circuit means to draw a current from said signal source means and to supply a related circuit from said isolation circuit means to said output means input terminal.

4,511,858

FREQUENCY PREPOSITIONING FOR AN INDIRECT FREQUENCY SYNTHESIZER

Jean-Claude Charavit, and Michèle Vandroux, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 269,588, Jun. 2, 1981, abandoned. This application Feb. 22, 1984, Ser. No. 582,132
Claims priority, application France, Jun. 3, 1980, 80 12279
Int. Cl.³ H03L 7/18
U.S. Cl. 331—10 **16 Claims**



1. An indirect synthesizer for producing asine wave output signal f_o with a switchable frequency comprising:

(a) a frequency switching control unit for generating signals which indirectly produce a transition to the desired sine wave output signal frequency;

(b) a prepositioning voltage generator for providing a prepositioning signal V_{NP} corresponding to the desired sine wave output signal frequency called for by a signal from said frequency switching control unit;

(c) a frequency switchable phase loop including a signal controlled oscillator having a control input and an output for providing said sine wave output signal, the frequency of said output signal f_N which serves as the output f_o of the synthesizer being controlled by a control signal V_N applied to said control input,

a programmable divider having a programming input coupled to said frequency switching control unit, for dividing the output of said oscillator by N, the value of N being determined by a signal from said frequency switching control unit, said divider providing a submultiple of oscillator frequency f_N at an output thereof,

a comparator circuit for comparing the output of said programmable divider with a reference signal input thereto and providing an error signal V_{NE} indicative of that comparison,

a summing circuit for summing said error signal V_{NE} from said comparator with said prepositioning signal V_{NP} from said prepositioning voltage generator and providing said control signal V_N at an output thereof coupled to said control input of said oscillator for controlling its output frequency f_N; and

(d) a memory having an input coupled to said output of said summing circuit for receiving values of V_N for storing a value of V_N at a time of a frequency switchover of output

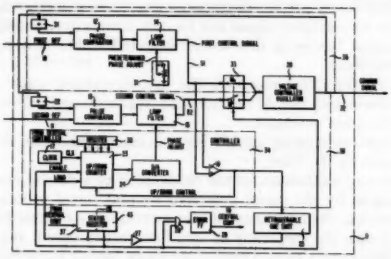
frequency from one output frequency to another, an output for delivering to said prepositioning voltage generator a value of control voltage V_N stored at a previous transition to the desired output frequency and an input coupled to said frequency switching control unit for receiving an instruction therefrom specifying the desired output frequency, the memory device delivering the appropriate value of V_N to the prepositioning voltage generator corresponding to the desired output frequency of said oscillator.

4,511,859

APPARATUS FOR GENERATING A COMMON OUTPUT SIGNAL AS A FUNCTION OF ANY OF A PLURALITY OF DIVERSE INPUT SIGNALS

Leonard C. Dombrowski, Batavia, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 30, 1982, Ser. No. 412,593
Int. Cl.³ H03L 7/22
U.S. Cl. 331—11 **22 Claims**



1. A circuit for generating at least one common signal as a function of any of a plurality of input signals, comprising:
first means for supplying said plurality of input signals;
second means for generating said at least one common signal in response to at least one of a plurality of control signals;
plurality of third means each for controllably generating at least one of said plurality of control signals as a function of the difference between at least one of said plurality of input signals and said at least one common signal;
fourth means for selectively coupling at least one of said plurality of said control signals to said second means; and
fifth means selectively responsive to at least one of said plurality of control signals for controlling generation by the third means of at least the control signals other than said at least one control signal to which said fifth means are responsive.

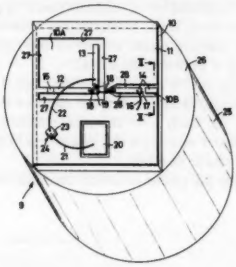
4,511,860

PLANAR MICROWAVE OSCILLATOR MOUNTED ON A DIELECTRIC CAVITY

Ezio M. Bastida, Segrate, and Paolo Bergamini, Milan, both of Italy, assignors to CISE Centro Informazioni Studi Esperienze S.p.A., Milan, Italy

Filed Jul. 7, 1982, Ser. No. 395,983
Claims priority, application Italy, Jul. 8, 1981, 22817 A/81
Int. Cl.³ H03B 5/18; H01P 3/08
U.S. Cl. 331—96 **6 Claims**

1. A planar oscillator having a dielectric cavity, operable at microwave frequencies, characterized in that it consists of a base of a dielectric material (**10, 110**) to a face of which there is superposed a continuous layer (**11, 111**) of a conductive material coating portions of said face, to remaining portions (**10A, 10B, 110A', 110A'', 110B**) of said face there being superposed strips (**12, 13, 14, 112, 113, 114**) of a conductive material separate from each other and electrically connected (**18, 118**) to an active component (**19, 119**), to the opposite face of said dielectric material base (**10, 110**) a dielectric cavity (**25, 125**) being adherent, said layer (**11, 111**) of conductive material acting as a grounding plane and at least a portion of each of said strips of conductive material forming at least one waveguide and (**12, 13, 14, 112, 113, 114**) acting as transmission lines (**12, 13, 112, 113**) and an output line (**14, 114**) of the oscillator (**9, 109**), the ratio of the width of the space existing between a



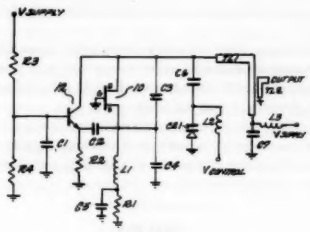
side of said portion of each of said strips and the nearest adjoining edge of said conductive material layer to the width of the strip itself at each and every point being constant.

4,511,861

VCO HAVING FIELD EFFECT AND BIPOLAR TRANSISTORS IN PARALLEL

Robert K. Bell, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Nov. 15, 1982, Ser. No. 441,774
Int. Cl.³ H03B 5/12, 5/02
U.S. Cl. 331—108 R **11 Claims**



1. A voltage controlled oscillator (VCO) comprising:
an oscillator circuit including a field effect transistor (FET) having gate, source and drain electrodes;
means for controlling the oscillating frequency of said oscillator circuit;
an output circuit coupled to said oscillator circuit; and
a circuit including a bipolar transistor having collector and emitter electrodes coupled in parallel with the source and drain electrodes of said FET for increasing the closed loop gain of the VCO, said bipolar transistor operating at a collector current lower than the drain current of said FET at the oscillating frequency.

4,511,862

PROGRAMMABLE MULTITONE DPSK MODULATOR

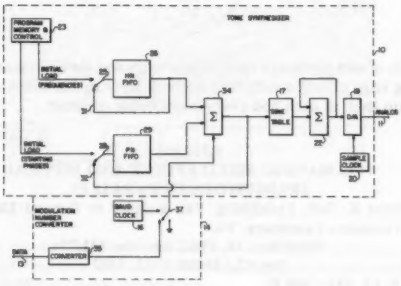
M. Arif Motiwala, Fairport, and Jack L. Sutherland, Rochester, both of N.Y., assignors to Harris Corporation, Melbourne, Fla.

Filed Oct. 20, 1982, Ser. No. 435,467
Int. Cl.³ H03C 3/00
U.S. Cl. 332—16 R **16 Claims**

1. A method of generating a composite analog signal containing a plurality of tones, each of the tones being a different harmonic of the same predetermined frequency, and each of the tones having a programmable frequency, amplitude and phase wherein the phase represents data, comprising the steps of:

(a) providing first and second memories;

(b) loading a plurality of digital harmonic numbers into the first memory, each of the digital harmonic numbers corresponding to a harmonic of a predetermined frequency and representing a tone;
(c) loading a plurality of digital phase numbers into the second memory, each of the phase numbers corresponding to the starting phase of one of the tones;
(d) providing a digital data signal;
(e) converting one or more bits of the digital data signal into a phase modulation number for each of the tones;
(f) summing for each tone the phase number with the harmonic number and with the phase modulation number to provide a phase number;
(g) circulating the phase numbers through the second memory;



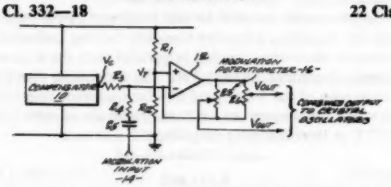
(h) circulating the harmonic numbers through the first memory;
(i) providing a third memory containing sinusoidal values;
(j) retrieving a sinusoidal value related to each phase number in response to the circulation of each of the phase numbers through the second memory;
(k) summing the retrieved sinusoidal values for each of the phase numbers to provide a composite digital signal; and
(l) converting the composite digital signal into a composite analog signal.

4,511,863

COMBINED MODULATION AND TEMPERATURE COMPENSATION CIRCUIT

Johannes J. Vandegraaf, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Mar. 22, 1983, Ser. No. 477,609
Int. Cl.³ H03C 3/08
U.S. Cl. 332—18 **22 Claims**



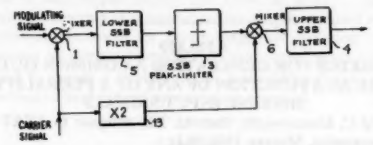
1. A combined modulation and temperature compensating circuit arrangement for driving an oscillator comprising:
means for receiving a D.C. temperature compensating signal from a temperature compensator;
means for receiving an A.C. modulating signal;
combining circuit means, coupled to said temperature compensating receiving signal means and modulating signal receiving means, for providing a combined temperature compensating and modulating signal having a predetermined ratio of magnitude of said D.C. temperature compensating signal and said A.C. modulating signal; and
adjustable output means for adjusting the level of the output signal of said combining circuit means without changing said predetermined ratio.

4,511,864

MODULATING DEVICE FOR A SINGLE-SIDEBAND MODULATION SYSTEM

Charles de Rivieré, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 12, 1983, Ser. No. 457,390
Claims priority, application France, Jan. 26, 1982, 82 01205
Int. Cl.³ H03C 1/60
U.S. Cl. 332—41 **6 Claims**



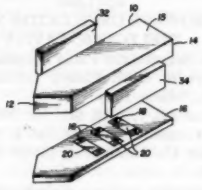
1. A modulating device for a modulation system of the single-sideband type, wherein said device comprises:
a first modulator for the modulation of a first carrier signal by a modulating signal and for delivering a first modulated signal having a first lower sideband and a first upper sideband;
a first filter, for receiving the first modulated signal, for eliminating one of the two first sidebands and delivering the other sideband;
a signal-processing device for processing the signal delivered by the filter;
a second modulator for the modulation of a second carrier signal by the signal delivered by said signal processing device, the frequency of said second carrier signal being double the frequency of said first carrier signal, and for delivering a second modulated signal having a component within the sideband which is eliminated by said first filter;
and a second filter for receiving a modulated signal, for eliminating the sideband retained by the first filter and for delivering the second sideband which is identical with the first sideband eliminated by said first filter.

4,511,865

MILLIMETER WAVE SIGNAL LIMITER HAVING FERRITE LOADED SLOTS IN GROUND PLANE OF IMAGE GUIDE

Samuel Dixon, Jr., Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 21, 1984, Ser. No. 581,833
Int. Cl.³ H01P 1/23
U.S. Cl. 333—17 L **16 Claims**



1. A slot excited millimeter wave power limiter, comprising:
dielectric transmission line means having a relatively high dielectric constant;
a conductive ground plane on which said dielectric transmission line means is located forming thereby an image guide;
said ground plane further including a plurality of slots of a predetermined area formed therein to provide a further propagating medium for energy propagating along said image guide, the dielectric constant of said transmission means causing the slot mode wavelength to be small com-

pared to the free space wavelength, thereby causing fields to be confined substantially to the area of said slots;

a body of ferromagnetic material located in each of said slots and having a biasing magnetic field applied thereto for causing magnetic moments in said ferromagnetic material to precess at a rate determined by the strength of said magnetic field whereby at a critical threshold level of incident signal power on said image guide, spin waves are generated in said ferromagnetic material to absorb signal energy and thus limit the power out of said image guide above said threshold level; and

magnetic field means located in relative close proximity to said body of ferromagnetic material for providing said biasing magnetic field.

4,511,866

ACOUSTIC SURFACE WAVE DEVICE

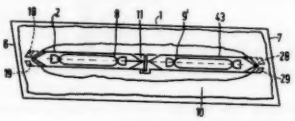
Robert F. Milsom, Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 13, 1983, Ser. No. 531,805

Claims priority, application United Kingdom, Sep. 15, 1982, 8226282

Int. Cl.³ H03H *9/64, 9/145, 9/30*

U.S. Cl. 333—194 **6 Claims**



1. An acoustic surface wave device comprising a piezoelectric substrate for propagating acoustic surface waves at a surface thereof and respective acoustic surface wave launching and receiving transducers formed on said surface to launch and to receive acoustic surface waves at said surface along a common propagation path directed along the axes of the transducers, wherein each said transducer includes at least one interdigital array of two overlapping sets of electrodes with each set connected to one of a pair of opposite bus bars, characterized in that the overall width of each interdigital array between the outer boundaries of each said pair of bus bars measured in a direction at right angles to the acoustic surface wave propagation direction is determined, in relation to the wavelength λ_c at the centre frequency f_c of the acoustic surface wave pass-band of the transducer, and in relation to the electrode distribution, so that each said interdigital array functions as an acoustic surface waveguide which will only propagate and transduce a single acoustic surface wave guided energy mode which is symmetrical about the central propagation axis of the array, and each said transducer comprises a corresponding apodized array.

4,511,867

ACOUSTIC SURFACE WAVE DEVICE INCLUDING A REFLECTIVE MULTISTRIP COUPLER

John Schofield, Coulsdon, England, assignor to U.S. Philips Corporation, New York, N.Y.

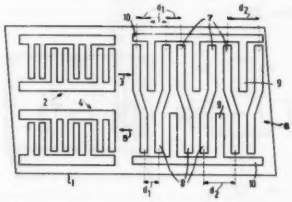
Filed Jul. 1, 1983, Ser. No. 510,094

Claims priority, application United Kingdom, Jul. 5, 1982, 8219372

Int. Cl.³ H03H *9/145, 9/64*

U.S. Cl. 333—195 **15 Claims**

1. An acoustic surface wave device comprising a piezoelectric substrate for propagating an acoustic surface wave at a surface thereof, transducer means for launching acoustic surface wave energy so as to propagate over said surface and for converting acoustic surface wave energy propagating over said surface into an electrical signal, and electrical coupling means for receiving acoustic surface wave energy propagating along a first propagation track and relaunching at least part of that energy as acoustic surface wave energy along a second propagation track, said electrical coupling means comprising a first array of electrically conductive strips across said first track and a second array of electrically conductive strips across said second track, each array including discrete parallel electrically conductive strips each of which is electrically insulated from the other said discrete conductive strips of that array and is electrically connected to a respective said discrete conductive strip of the other array such that the successive said discrete conductive strips of each array are electrically connected to the successive said discrete conductive strips of the other array, the centre-to-centre spacings of the successive said discrete conductive strips of each array being alternately relatively large and relatively small, the relatively large centre-to-



centre spacing being aproximately twice the relatively small centre-to-centre spacing, the said discrete conductive strips of the two arrays being interconnected such that, in each array, the said discrete conductive strips of each pair which have a said relatively large centre-to-centre spacings are connected to the respective strips of a pair in the other array which have a said relatively small centre-to-centre spacing, characterized in that each array includes a plurality of further electrically conductive strips which are parallel to the said discrete conductive strips of that array, in that a further strip is situated between the respective discrete conductive strips forming substantially every pair having a said relatively large centre-to-centre spacing, and in that all said further electrically conductive strips in both said arrays are electrically interconnected.

4,511,868

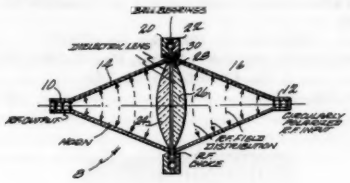
APPARATUS AND METHOD FOR TRANSFER OF R.F. ENERGY THROUGH A MECHANICALLY ROTATABLE JOINT

Robert E. Munson, and Hussain A. Haddad, both of Boulder, Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Sep. 13, 1982, Ser. No. 417,517

Int. Cl.³ H01P *1/06*

U.S. Cl. 333—257 **23 Claims**



1. An r.f. rotary joint comprising:

a first horn means having a small end and a large end for forming substantially planar r.f. wave fronts at its large end;

a second horn means having a small end and a large end for forming substantially planar r.f. wavefronts at its large end;

the large ends of said horn means being opposingly juxtaposed so that said substantially planar r.f. wavefronts can

pass between said large ends substantially independently of the relative rotational positions of said horns; and

a rotary motion bearing disposed about and physically interconnecting said juxtaposed large ends of the horn means;

wherein at least one of said horn means includes at least one r.f. lens structure disposed at the juncture of said juxtaposed large ends of the horn means.

4,511,869

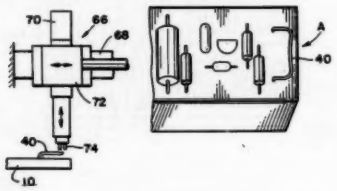
RADIO CIRCUIT TUNED BY ADJUSTABLY DEFORMING AN INDUCTANCE COIL

Daniel S. Snyder, Norwalk, and Timothy C. Benincasa, Bellevue, both of Ohio, assignors to Imperial Clevite Inc., Glenview, Ill.

Filed Feb. 15, 1983, Ser. No. 466,428

Int. Cl.³ H03J 7/30

U.S. Cl. 334—20 **5 Claims**



1. A method of tuning a radio frequency circuit including an inductive loop having an exposed inductor portion comprising:

detecting the frequency of operation of said circuit with a frequency detecting device;

associating said inductor portion with a selectively movable actuator device coupled to said frequency detecting device by nesting said inductor portion in a receiving slot of a movable plunger arm of said actuator device;

adjusting the configuration of said exposed inductor portion by moving said actuator device in response to control signals from said frequency detecting device whereby the inductance of said inductive loop and the frequency of operation are associatively varied;

fixing the configuration of said exposed inductor portion at a position of adjustment to determine the frequency of operation to be at a pre-selected frequency; and

disassociating said inductor portion from said actuator device whereby said radio frequency circuit is tuned to the pre-selected frequency.

4,511,870

FOCUSSING SOLENOID, APPLICATION THEREOF AND A PROCESS FOR MANUFACTURING SAME

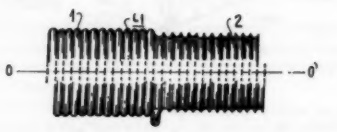
Pierre Caillat, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 28, 1983, Ser. No. 470,526

Claims priority, application France, Mar. 5, 1982, 82 03731

Int. Cl.³ H01F 5/02, 7/06

U.S. Cl. 335—213 **20 Claims**



1. In a focussing solenoid formed by an insulated wire wound in the form of a helix around an insulating cylindrical sleeve, the turns of the helix being jointing and the solenoid comprising several superimposed wire layers having the same winding direction around the sleeve, said sleeve having a helical etching in which the turns of the first layer are housed, and the slope of the turns of the helix with respect to said sleeve of each of the wire layers wound in a helix around the sleeve is substantially the same, connecting means being provided between the wire layers to obtain a substantially uniform magnetic field parallel to the sleeve axis.

4,511,871

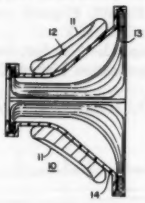
MODIFIED DEFLECTION YOKE COILS HAVING SHOOTBACK WINDINGS

John H. Schier, Jr., Greenwood, and William E. Brooks, Jr., Indianapolis, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 18, 1983, Ser. No. 514,988

Int. Cl.³ H01F 5/00

U.S. Cl. 335—213 **8 Claims**



1. A deflection yoke comprising:

a magnetically permeable core;

a deflection coil toroidally wound on said core comprising:

a first winding emplacement incorporating a plurality of wire turns occupying a first arcuate region on said core;

at least a first additional winding emplacement wound after said first winding emplacement and incorporating a plurality of wire turns that overlay said first winding emplacement, and incorporating at least one wire turn that extends beyond an end of said first winding emplacement and lies level with wire turns thereof such that lateral displacement of the extending wire turn is obstructed by the presence of said first winding emplacement.

4,511,872

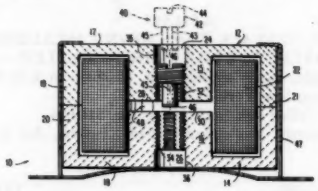
INDUCTANCE TUNING MEANS AND METHODS OF MANUFACTURE

Robert W. Olmsted, and Joseph F. Huth, III, both of Butler, Pa., assignors to Spang Industries Inc., Butler, Pa.

Filed Nov. 5, 1982, Ser. No. 439,372

Int. Cl.³ H01F 21/06, 41/02

U.S. Cl. 336—83 **5 Claims**



1. Method for manufacturing a magnetically-soft ferrite pot core element to provide unitary means for adjusting the air gap presented by a pair of ferrite pot core elements assembled to form a ferrite pot core in which coil windings are positioned, comprising

providing a substantially homogeneous mass of particulate

ferrite-forming material which is reactive when treated at elevated temperature to form a magnetically-soft ceramic ferrite,

molding such ferrite-forming material at elevated pressure to form a unitary part compacted in a green state for conversion to a ceramic-state ferrite pot core element including

an elongated center post symmetrically distributed about a centrally located longitudinal axis,

such center post terminating in a distal end surface, lying in a plane which is transverse to the centrally located longitudinal axis, for use in defining an air gap in such assembled electrical inductance device,

a web portion extending in transverse relationship to such centrally located axis at the remaining end of such center post longitudinally opposite to such distal end surface, and

a skirt portion extending from such web in space relationship from such center post and extending in an axial direction to define a space for positioning coil windings between such center post and such skirt portion,

such center post presenting an inner wall surface defining a central opening extending longitudinally with and substantially symmetrically about the centrally located longitudinal axis,

such inner wall surface including axially-directed reentrant portions separated by axially-directed non-reentrant portions,

establishing unitary die means within such center post central opening for acting on a thread-free nonmagnetic portion of an elongated air gap adjustor member,

such die means including

helically-oriented screw thread means for providing axial movement of an air gap adjustor member upon rotation within such central opening of a ferrite pot core element,

such helically-oriented screw thread means consisting of discontinuous helically-oriented threads established on such axially-directed non-reentrant portions of such center post inner wall surface,

such helically-oriented threads being interrupted along such inner wall surface by such axially-directed reentrant portions,

such axially-directed reentrant portions defining thread-free longitudinally-open flute means which remain longitudinally open after insertion of such elongated adjustor member into such central opening,

such discontinuous helically-oriented screw threads being formed in such non-reentrant portions of the inner wall surface of the central opening of the unitary part compacted from ferrite-forming material while such unitary part is in a green state after pressure compaction, and

following forming of such discontinuous screw threads,

sintering such core part utilizing an elevated temperature to convert such compacted part from such green state to a ceramic state.

4,511,873

CURRENT TRANSFORMER INSULATED BY PRESSURIZED GAS

Manfred Baier, Oberehrendigen, and Andreas Tobler, Lengnau, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

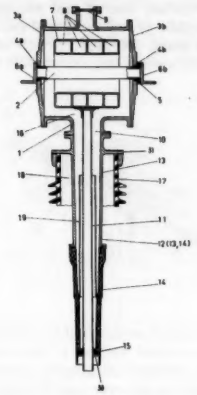
Filed Jul. 8, 1983, Ser. No. 511,942

Claims priority, application Switzerland, Jul. 19, 1982, 4392/82

Int. Cl.³ H01F *27/02*

U.S. Cl. 336—90 **5 Claims**

1. A current transformer comprising a metallic top housing containing a primary conductor surrounded by coil means of a secondary circuit; said top housing having a high voltage therein; hollow insulator means mounted on base means; said top housing being supported by said insulator means; tubular metallic lead-through means disposed within said insulator means and extending from said top housing to said base means for receiving terminal leads of said secondary circuit; and gas-tight partition means connected to said top housing for separating a high-pressure gas region encompassing said primary conductor and said coil means from a low-pressure gas region defined at least in part by said insulator means.



4,511,874

FATIGUE-RESISTANT FUSE STRIP

John F. Rasmussen, North Andover, Mass., and Aldino J. Gaia, St. Louis, Mo., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Mar. 31, 1983, Ser. No. 480,766

Int. Cl.³ H01H *85/04*

U.S. Cl. 337—159 **20 Claims**

1. An electrical fuse comprising a fusible ribbon having at least one weak spot along its axial length which is resistant to mechanical fatigue, said weak spot of said fusible ribbon comprising a series of apertures having geometric centers arranged in a curvilinear or angular configuration which extends transversely to said axis of said fusible ribbon between opposite edges thereof, wherein the geometric centers of said apertures nearest the opposite edges are substantially colinear with respect to the transverse axis of the fusible ribbon and wherein the geometric centers of adjacent apertures of said series of apertures are offset from each other with respect to the transverse axis of said fusible ribbon by a distance at least equal to the shortest distance between the geometric center and the peripheral edge of any one of said adjacent apertures, whereby the cross-sectional area of said weak spot is distributed transversely across said fusible ribbon.

4,511,875

MICRO-FUSE ASSEMBLY

Hiroo Arikawa, Tokyo, Japan, assignor to S.O.C. Corporation, Tokyo, Japan

Filed Mar. 17, 1983, Ser. No. 476,229

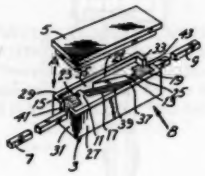
Claims priority, application Japan, Mar. 19, 1982, 57-37984[U]

Int. Cl.³ H01H *85/02*

U.S. Cl. 337—201 **8 Claims**

1. An electric micro-fuse comprising a hollow body defined

by a base, opposed sidewalls upstanding from said base and opposed end walls upstanding from said base; a cover for sealing said body; said body having two raised sections and three recessed sections, one of said recessed sections being disposed at the middle of said body and each of the other two recessed sections being disposed at each end of said hollow body, a first channel connecting said middle recessed section to



one of said end recessed section and a second channel connecting said middle recessed section to the other end recessed section; a fusible element diagonally stretched across said middle recessed section between said first and second channels; a pair of lead wires, a first lead wire extending through one of said end walls and secured to one end of said fusible element and a second lead wire extending through the other end wall and secured to the other end of said fusible element.

4,511,876

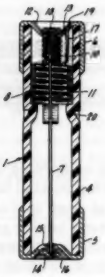
ELECTRICAL FUSE WITH RESPONSE INDICATOR

Angelo Urani, St. Louis, Mo., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Feb. 7, 1983, Ser. No. 464,729

Int. Cl.³ H01H *85/30*

U.S. Cl. 337—244 **11 Claims**



1. An elongated fuse device having a tubular insulating housing having first and second end terminals, a fuse element connected to the first end terminal and extending longitudinally through the housing, a spring/indicator unit including a spring coil and an integrated close wound indicator coil of a substantially smaller diameter located within the housing adjacent said second end terminal, said indicator coil being wound as an extension from one end of said spring coil, said spring coil having a diameter substantially larger than said fusible element with said fusible element extending therethrough, said fusible element extending through and connected to said indicator coil, means electrically connecting said fuse element to said second end terminal and constructed and arranged to permit movement of said spring/indicator unit upon opening of said fusible element, said housing including an internal stop wall means, said spring being located between said stop wall means and said second terminal whereby said fuse element holds the spring in a stressed state with said indicator withdrawn into said housing, fusing of said element releasing said spring coil to release its stress and thereby move said indicator coil at least partially from within said housing to provide an indication of a blown fuse.

4,511,877

STRAIN GAUGE WITH REDUCED CREEP PHENOMENON BY IMPROVED INSULATION LAYERING

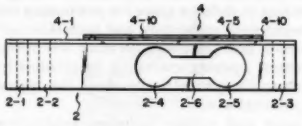
Hisashi Nishikawa; Satoshi Suzuki; Masanobu Hirata, all of Shizuoka; Koichiro Sakamoto; Ikuo Fujisawa, both of Mishima, and Shozo Takeno, Yokohama, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1983, Ser. No. 465,344

Claims priority, application Japan, Feb. 18, 1982, 57-24939

Int. Cl.³ G01L *1/22*; G01B *7/18*; G01G *3/14*

U.S. Cl. 338—2 **17 Claims**



1. A strain sensor comprising:

a beam body having a strain generating section;

an insulating resin film mixed with solid powder which includes silicon dioxide on said beam body at least over said strain generating section; and

a resistance layer on at least a portion of said insulating resin film.

4,511,878

PRESSURE SENSOR WITH IMPROVED SEMICONDUCTOR DIAPHRAGM

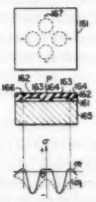
Satoshi Shimada; Ken Murayama; Shigeyuki Kobori, all of Hitachi, and Kanji Kawakami, Mito, all of Japan, assignors to Hitachi, Ltd. and Hitachi Const. Mach. Company, both of Tokyo, Japan

Filed Sep. 20, 1983, Ser. No. 534,076

Claims priority, application Japan, Sep. 20, 1982, 57-162323

Int. Cl.³ G01L *9/06*

U.S. Cl. 338—4 **8 Claims**

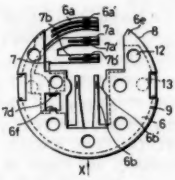


1. A pressure sensor of semiconductor type, comprising a semiconductor diaphragm having upper and lower surfaces and including at least one of thin wall parts provided by forming at least one recess in said lower surface and at least one of thick wall parts, said thin wall parts having such a thickness and a shape that local flexibility arises in said upper surface in said thick wall parts, piezoresistance elements each laid on said upper surface in an area outside the area of the at least one recess where the local flexibility arises, and a supporting member jointed to said thick wall parts at said lower surface for supporting said diaphragm.

4,511,879
SLIDER ARRANGEMENT AND METHOD OF PRODUCING OF THE SAME

Shosaku Fujii, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,189
Claims priority, application Japan, Dec. 10, 1982, 57-215582
Int. Cl.³ H01C *1/12, 10/34;* H01H *19/00;* H01R *39/00*
U.S. Cl. 338—174 2 Claims

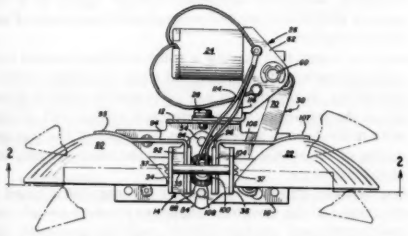


1. A slider arrangement for a variable resistor having two resistive elements each adapted to be connected electrically to a respective collector by respective sliders ganged together for simultaneous actuation; said slider arrangement being formed by a member molded from an insulative material and having embedded therein during its molding a resilient metal plate having four elongate contact elements extending outwardly from said member, said metal plate having means including connecting portions serving to connect said contact elements together and exposed from said member so that said connecting members may be severed to isolate said contact elements into two pairs with the contact elements of each pair being connected together and adapted to engage a respective resistive element and associated collector.

4,511,880
TWIN OSCILLATING LIGHT

Edward S. Stanuch, Oak Forest, Ill., assignor to Federal Signal Corporation, Oak Brook, Ill.

Filed Sep. 29, 1982, Ser. No. 426,990
Int. Cl.³ B60Q *1/00*
U.S. Cl. 340—84 10 Claims

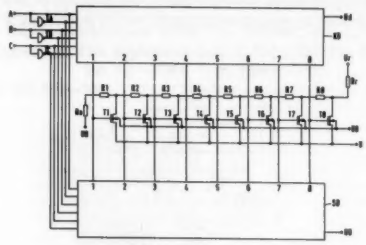


2. A twin oscillating light assembly for use on emergency vehicles and the like comprising, in combination, a first light source mounted for oscillating movement about first and second axes to produce a first generally linear light path, a second light source mounted for oscillating movement about first and second axes to produce a second generally linear light path, said first and second light sources being arranged so said first and second light paths cross to produce an approximate X-pattern of light, and motor means for oscillating said first and second light sources.

4,511,881
INTEGRATED VOLTAGE DIVIDER WITH SELECTION CIRCUIT

Fritz G. Adam, Freiburg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,819
Claims priority, application European Pat. Off., May 16, 1981, 81103764.7
Int. Cl.³ H03K *13/02, 13/03*
U.S. Cl. 340—347 DA 7 Claims



1. An integrated voltage divider comprising a series arrangement of a number (N) of resistors operated from a biasing voltage (Ur), with the tapping points thereof each, via a switching connection comprising one individual switching transistor or a series arrangement of switching transistors and dependent upon a digital selecting signal, capable of being connected through to the voltage output (U) by means of a selection circuit, with said selection circuit, said resistors (R . . .) and said switching connections employing transistors of the insulated-gate field-effect type, wherein each switching connection is realized by the switching section of one single switching transistor of the one selected channel conductivity type;

a selection circuit comprising short circuit decoder (KD) and an open circuit decoder (SD) the corresponding inputs of which are arranged in parallel and supplied with the corresponding bits of the selecting signal;

said open-circuit decoder (SD) comprising transistors of one selected channel conductivity type which are arranged in the semiconductor body of the integrated voltage divider as connected to a reference potential (UO) of the source of voltage (Ur), the potential input of the open circuit decoder connected to the reference potential (UO);

said short-circuit decoder (KD) comprising transistors of the other channel conductivity type, which are arranged within a separate insulating island (NW) of the one selected channel conductivity type, the potential input of the short circuit decoder connected to this insulating island (NW) and to the operating voltage (Ud), wherein

like outputs of both the open-circuit and the short-circuit decoders (SD, KD) are connected to one another and to the respective gates of the switching transistors (T . . .), such that upon the supply of the bits of the selecting signal, the appropriate sections of the switching transistors are turned on to permit the desired output voltage.

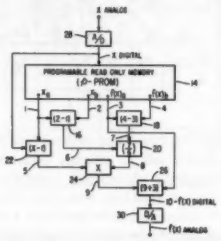
4,511,882
FUNCTION GENERATOR

Marion A. Keyes, IV, Chagrin Falls, and William L. Thompson, Chardon, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 2, 1982, Ser. No. 394,563
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD 3 Claims

1. A function generator producing a digital output signal varying in predetermined non-linear relationship to a digital input signal, comprising, a PROM receiving said digital input signal programmed to generate a first and a second readout

signal corresponding to selected minimum and maximum values of said input respectively and third and fourth readout signals corresponding to the non-linear relationship between the input and output signals at said minimum and maximum values of said input signal respectively, means generating a fifth signal proportional to the difference between the input signal and said first signal, means generating a sixth signal proportional to the difference between said second and first signals, means generating a seventh signal proportional to the difference between said fourth and third signals, means generating an eighth signal proportional to the quotient of said sixth signal divided by said seventh signal, means generating a ninth



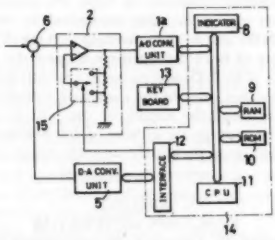
signal proportional to the product of said fifth signal multiplied by said eighth signal, and means generating a tenth signal proportional to the sum of said third and ninth signals whereby said tenth signal varies in said non-linear relationship to said input signal and said PROM being programmed to generate said first, second, third, and fourth readout signals at a plurality of selected values of said input signal and including means selecting for readout the output signals generated by the two consecutive selected input signals, one having a value less than and the other having a value greater than said input signal to form said selected minimum and maximum values of said input signal.

4,511,883

A-D CONVERTER FOR USE IN AN ELECTRONIC BALANCE

Akira Komoto, Otsu, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Jul. 28, 1982, Ser. No. 402,582
Claims priority, application Japan, Jul. 31, 1981, 56-121294
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **2 Claims**



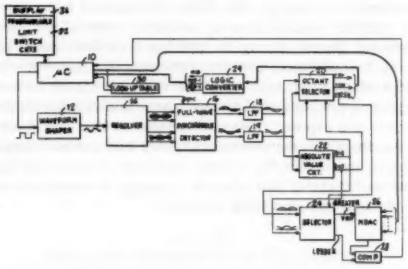
1. An A-D converter for use in an electronic balance comprising:
- a pulse-modulating D-A converting unit which converts an input digital signal to an analog output signal;
- an analog subtracter which subtracts the analog output signal of said pulse-modulating D-A converting unit from the analog signal to be measured;
- a switching means for selecting either the full output signal of said analog subtracter or the signal reduced to one N-th of the same;
- an A-D converting unit which converts the analog output of said switching means to a digital signal;
- a digital memory which can store a digital signal whose value is predetermined in accordance to said signal reduced to one N-th;
- a digital adder which adds said signal reduced to one N-th; with the same multiplied by N, to the output of said A-D converting unit; and
- a leading means for leading said digital signal stored in said digital memory to the input terminals of said pulse modulating D-A converting unit.

4,511,884

PROGRAMMABLE LIMIT SWITCH SYSTEM USING A RESOLVER-TO-DIGITAL ANGLE CONVERTER

Peter G. Serev, Woodbury, and Roger M. Bogin, Washington Depot, both of Conn., assignors to C & A Products, Inc., Washington Depot, Conn.

Filed Nov. 9, 1982, Ser. No. 440,421
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 SY **4 Claims**



1. A resolver-to-digital angle converter comprising:
- a microcomputer programmed to generate periodic highest priority interrupts and to complement an output bit at every interrupt and thereby generate a programmed square wave output;
- a waveform shaper which comprises a bandpass filter and is driven by the status of said output bit to produce a substantially sinusoidal reference voltage signal at a frequency determined by the programmed interrupts of said microcomputer;
- a resolver transducer having a rotor winding excited with said reference voltage signal and a pair of stator windings producing, in response, a pair of two-wire outputs which are at the frequency of the reference voltage but are amplitude-modulated as respective functions of the sine and cosine of the spatial angle between the resolver rotor and stator windings;
- a synchronous detector comprising a comparator timed to the output of the waveform shaper to produce switch-control signals and analog CMOS switches timed by said switch control signals and receiving the resolver outputs and fullwave rectifying them to respective polarities determined by their sine and cosine amplitude modulation to thereby produce a fullwave rectified sine detector output and a fullwave rectified cosine detector output;
- a sine active low pass filter and a cosine active low pass filter receiving the respective sine and cosine detector outputs and providing their respective sine and cosine envelopes as outputs;
- an absolute value circuit receiving the sine envelope and providing the absolute value thereof and comprising a comparator receiving the output of the sine filter and

providing an output which is high for the first four octants and low for the last four octants of the sine filter output, an analog CMOS switch controlled by the output of the comparator, and an operational amplifier having a positive input receiving the output of the last-recited switch and a negative input receiving the output of the sine filter and providing said absolute value at its output, and a corresponding absolute value circuit receiving the cosine envelope and providing the absolute value thereof;

an octant selector receiving the sine and cosine envelopes and comparing each to zero, and receiving the absolute values of the same envelopes and comparing them with each other, to provide three most significant bit outputs, the first determined by the polarity of the sine envelope, the second by the polarity of the cosine envelope and the third determined by the absolute value comparison;

a selector circuit receiving said absolute values of said envelopes and the third most significant bit to provide, for any given octant, a first output which is the greater of the two absolute value envelopes and a second output which is the lesser one;

means driven by said microcomputer and synchronized to said interrupts, for performing successive approximation analog-to-digital conversion of the selector circuit outputs and for providing a binary code output representative of the tangent of the shaft angle within a given octant;

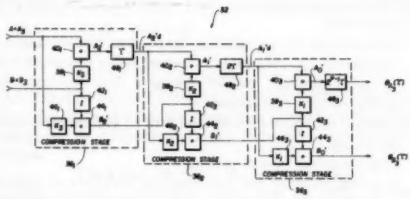
means for combining said three most significant bits with said binary code output to provide a binary code representation of the shaft angle; and

means for utilizing said shaft angle.

4,511,885
CODE COMPRESSOR FOR MULTILEVEL INTERLEAVED MULTIPLEXED NOISE CODES

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 28, 1983, Ser. No. 555,774
Int. Cl.[3] H03K *13/24*
U.S. Cl. 340—347 DD **21 Claims**



12. Apparatus for compressing a pair of expanded noise codes comprised of first and second multilevel code mates and having a predetermined number of code bits defining the code length of said code mates, comprising:

a plurality of series coupled compression stages, each stage including,

means for generating third and fourth multilevel code mates respectively comprised of first and second multilevel input code mates multiplied by a predetermined gain factor not necessarily equalling unity;

means for combining said first multilevel code mate with said fourth multilevel code mate in a first manner to form a first compressed code mate having one half the number of code bits of the first and second multilevel input code mates;

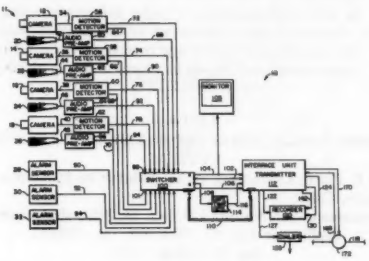
means for combining said third multilevel code mate with said second multilevel code mate in a second manner to form a second compressed code mate also having one half the number of code bits of the first and second input code mates; and

means for delaying said first compressed code mate by a time delay equal to an integer multiple of the code bit width of said codes for providing a first output code mate coincident in time with said second compressed code mate, said second compressed code mate being a second output code mate.

4,511,886
ELECTRONIC SECURITY AND SURVEILLANCE SYSTEM

Michael J. Rodriguez, Lilburn, Ga., assignor to Micron International, Ltd., Tucker, Ga.

Continuation-in-part of Ser. No. 499,946, Jun. 1, 1983, abandoned. This application Oct. 6, 1983, Ser. No. 538,848
Int. Cl.[3] G08B *1/08;* **H04N** *7/18*
U.S. Cl. 340—534 **5 Claims**



1. Security and surveillance system comprising a central station connected to a plurality of remote installations by means of a transmission medium having a finite information bandwidth wherein:

a. each remote installation comprises:

i. a plurality of surveillance equipment associated with a plurality of monitored locations for collecting raw security information including audio, video, and alarm information;

ii. switching means with a plurality of inputs connected to the surveillance equipment for sampling the security information at its inputs in serial fashion and providing the security information at its output, the switching means being capable of locking onto a particular input in response to an alarm condition at a particular monitored location; and

iii. interface unit transmitter means connected to the output of the switching means for receiving and processing the raw security information including:

(a) video compressor means for compressing the video information in bandwidth to provide compressed video information;

(b) alarm decoder means for generating an alarm code from the alarm information in order to identify the particular location of an alarm condition;

(c) sub-channel modulator which uses a key frequency unique to each remote installation to modulate and thereby sub-channelize the audio information, the compressed video information, and the alarm code to provide processed, sub-channelized security information within a base band frequency spectrum of predetermined size; and

(d) transmitter means including channel modulator to translate in frequency the base band frequency spectrum with its processed, sub-channelized security information into an available downstream channel of the transmission medium; and

b. the central station comprises:

i. receiver means including channel demodulator connected to the transmission medium for recovering the

processed, sub-channelized security information from the available downstream medium channel;

ii. a plurality of interface unit receivers each associated with a remote installation and connected to the channel demodulator for reprocessing the processed, sub-channelized security information including:

(a) sub-channel demodulator which uses the key frequency unique to the associated remote installation to recover the audio information, the compressed video information, and the alarm code from the sub-channelized security information within the base band frequency spectrum; and

(b) video expander means for expanding the compressed video information to provide the video information; and

iii. master switching means connected to the interface unit receivers for selecting for display on command particular audio information and video information; and

iv. command unit connected to the master switching means and the interface unit receiver for controlling the master switching means in response to the alarm code.

4,511,887

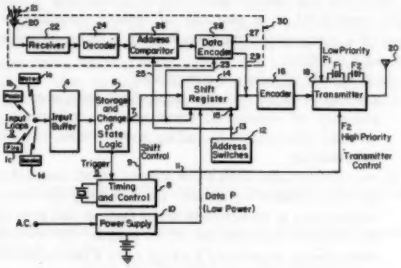
LONG RANGE WIRELESS ALARM MONITORING SYSTEM

Louis T. Fiore, Larchmont, N.Y., assignor to Radionics, Inc., Salinas, Calif.

Continuation of Ser. No. 302,125, Sep. 14, 1981, abandoned. This application Feb. 13, 1984, Ser. No. 579,852

Int. Cl.³ G08B *26/00*

U.S. Cl. 340—539 **4 Claims**



1. A long range wireless alarm monitoring system which employs an existing FM transmitter or a subcarrier allocation of an existing broadcast band FM transmitter, said system comprising:

a central station;

a plurality of remote responder stations capable of operating in either one-way or two-way communication with said central station, each remote responder station having clock means for measuring elapsed time, a radio frequency transmitter, one or more transducer means for sensing physical conditions, encoder means for producing a unique multi-bit word and control means for controlling said clock means, said transmitter and said transducer means;

said control means causing said transmitter to transmit a repeated signal comprised of said unique multi-bit word when said transducer means senses a change in a sensed physical condition and said control means further causing said transmitter to transmit said repeated signal indicating the operating state of said remote responders upon said clock means indicating a predetermined elapsed time;

said central station having receiver means for receiving transmissions from said remote responders, decoder means for decoding said repeated signals and information processing means associated with said receiver means and said decoder means for processing said decoded signals, said information processing means including output means for displaying the results of said processing.

4,511,888

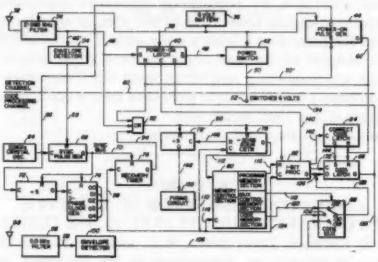
DUAL SIGNAL ELECTROMAGNETIC ARTICLE THEFT DETECTOR

Terry L. Bernhardt, Scottsdale, Ariz., assignor to U.S. Currency Protection Corp., Phoenix, Ariz.

Filed Jun. 29, 1983, Ser. No. 509,288

Int. Cl.³ G08B *13/22, 13/00*

U.S. Cl. 340—571 **20 Claims**



1. A security system for detecting the removal of an article from a premises to be protected, the protected premises including at least one exit through which the article may be removed from the protected premises, said security system comprising in combination:

a. a transmitter for transmitting first and second signals in the vicinity of said exit, said first signal being transmitted as a series of periodic pulses having a first predetermined period of time therebetween:

b. receiver means carried by said article, said receiver means including:

i. an electrical power source;

ii. a first receiver for detecting the presence of said first signal, said first receiver being continuously coupled to said electrical power source for continuously receiving electrical power therefrom, said first receiver generating an enabling signal upon detecting said first signal;

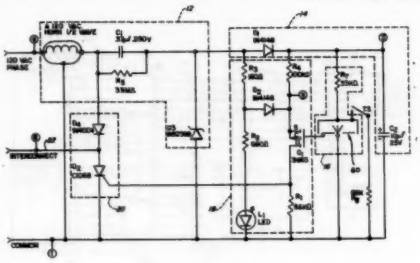
iii. a second receiver for detecting the presence of said second signal and providing an alarm in response thereto, said second receiver generating a disabling signal upon failing to detect said second signal within a second predetermined period of time after said enabling signal is generated, said second predetermined period of time being shorter than said first predetermined period of time; and

iv. power switching means responsive to said enabling and disabling signals for selectively electrically coupling said electrical power source to said second receiver following the generation of said enabling signal and decoupling said electrical power source from said second receiver means following the generation of said disabling signal for lessening the amount of electrical power drained from said electrical power source during instances when said receiver means is exposed to said first signal in the absence of said second signal.

4,511,889
SURGE PROTECTED SMOKE ALARM

Richard G. Atwater, Brookfield, Ill., assignor to Firex Corporation, Downers Grove, Ill.

Filed Sep. 30, 1982, Ser. No. 431,048
Int. Cl.³ G08B 17/10
U.S. Cl. 340—629 2 Claims

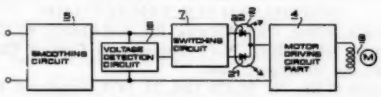


1. A smoke alarm for operation from an AC line voltage source comprising:
- an ionization current smoke detector having a plate suitable for holding a floating plate voltage,
- an AC voltage drive warning horn having an inductive coil connected to the AC source,
- voltage clipping means for generating a square wave voltage from the AC line voltage,
- rectifying means connected to said voltage clipping means for rectifying said square wave to provide substantially constant voltage DC power connected to said smoke detector to power said detector, and
- threshold detection means connected to said smoke detector plate for setting a predetermined threshold voltage and determining when the smoke detector plate voltage exceeds said threshold voltage, said inductive coil of said horn being connected in series between said AC line voltage and said voltage clipping means so that current passing through said voltage clipping means necessarily passes through said coil.

4,511,890
ENERGIZATION INDICATOR FOR TIME SWITCH

Fumio Kouzai, and Yoshiaki Motoki, both of Hiroshima, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1982, Ser. No. 368,506
Claims priority, application Japan, Apr. 16, 1981, 56-58201
Int. Cl.³ G08B 21/00
U.S. Cl. 340—644 4 Claims

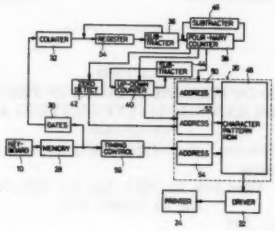


1. An energization indicator for time switch comprising:
- (a) a motor driving circuit for the time switch;
- (b) a dc converting circuit for dropping, rectifying and smoothing voltage of commercial power source and supplying power to said motor driving circuit at either of a plurality of output voltages,
- (c) a voltage detection circuit for detecting the output voltage of said dc converting circuit and generating a signal dependent on which of the output voltages is being supplied by said converting circuit,
- (d) a switching circuit for selectively switching in energization circuit for the output voltage of said dc converting circuit to said motor driving circuit in series with either a first load circuit or a second load circuit in response to the signal from said voltage detection circuit, and
- (e) light emission elements inserted into said first and second load circuits, respectively and emitting different colors from one another to indicate which of said output voltages is being supplied to said motor driving circuit.

4,511,891
MONEY INFORMATION PRINT CONTROL SYSTEM

Hiroshi Nakatani, and Hachizou Yamamoto, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 15, 1982, Ser. No. 368,754
Claims priority, application Japan, Apr. 27, 1981, 56-64653
Int. Cl.³ G09G 1/00
U.S. Cl. 340—734 13 Claims

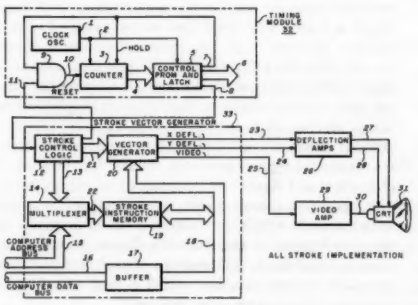


1. A system for converting amount information of plural digits from a numeric to a non-numerical symbolic representation thereof comprising:
- means for introducing amount information represented as a numerical character string;
- means for determining the order position of each numerical character representing said amount information;
- means, responsive to the order position of each numerical character determined by said means for determining, for generating non-numerical symbology representative of the order position of said amount information.

4,511,892
VARIABLE REFRESH RATE FOR STROKE CRT DISPLAYS

Steven P. Grothe, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 25, 1982, Ser. No. 392,206
Int. Cl.³ G09G 1/04
U.S. Cl. 340—739 6 Claims



1. In a display system of the type having a stroke vector display generator means for supplying stroke information to at

least one cathode ray tube, wherein the improvement comprises:

means for providing signals representative of minimum refresh intervals for said stroke information to be displayed on said at least one cathode ray tube;

means cupled to said stroke vector display generator means for initiating said stroke information and for providing signals representative of completions of said stroke information; and

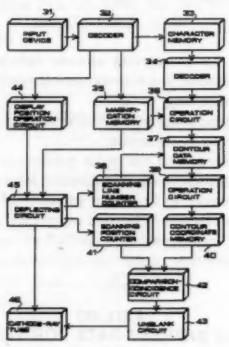
means coupled to said minimum signal means and said stroke initiation and completion signal means for recycling said display system when a minimum stroke refresh representative signal and a stroke completion representative signal are received, thereby extending refresh intervals for said stroke information for a time necessary to display said stroke information.

4,511,893

METHOD OF STORING IMAGES IN THE FORM OF CONTOURS AND PHOTO-TYPESETTING APPARATUS THEREOF

Shinichiro Fukuda, Tokyo, Japan, assignor to Shaken Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,160
Int. Cl.³ G09G *1/16*
U.S. Cl. 340—747 **7 Claims**



1. A photo-typesetting apparatus comprising:

(a) A character-figure memory means for dividing contours of characters and figures at suitable positions into a plurality of contour elements, said character-figure memory means obtaining coordinate information of $(n+1)$ points on each respective contour element, wherein $n \geqq 2$ consisting of at least a start point and an end point of each said contour element, and of arbitrary points numbering $(n-1)$, wherein $n \geqq 2$, existing on each said contour element, said points comprising contour element data defining said contour elements, said character-figure memory means storing said contour element data concerning all contour elements constituting said characters and figures,

(b) a character-figure generator means for forming said characters and figures by scanning of an energy beam,

(c) an operation circuit means for calculating coordinate information in which the contour element crosses a scanning line formed by said character-figure generator means from the coordinate informations of each said point defining each contour element which is read out from said character-figure memory means, and

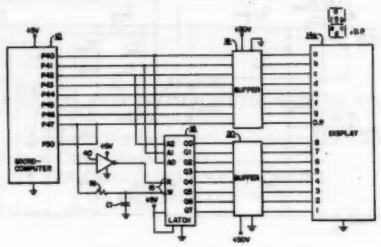
(d) unblanking circuit means for controlling the activation and deactivation of said energy beam, in response to the results calculated by said operation circuit means.

4,511,894

ELECTRONIC DISPLAY APPARATUS USING TIME MULTIPLEXED DATA AND CONTROL SIGNALS

Paul M. Johnston, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1981, Ser. No. 331,726
Int. Cl.³ G09G *3/10*
U.S. Cl. 340—756 **8 Claims**



1. Electronic display apparatus, comprising:

a display device comprising a plurality of digits and a like number of digit select inputs, each digit comprising a plurality of character segments selectively energizable to form a set of display characters and a like number of segment inputs the energization of which produces energization of the corresponding character segment;

an addressable latch device comprising an ENABLE input, a plurality of address inputs, and a plurality of outputs each connected to one of said digit select inputs and selectable by a unique pattern of energization of said latch address inputs, the selected output being latchably energizable upon actuation of said ENABLE input;

a microprocessor for generating said latch address input energization patterns, for generating data to be displayed, and for converting said display data to a multi-segment code to energize the proper display device segments to display said data, said microprocessor comprising a plurality of data outputs each connected to one of said segment inputs, said data outputs also being connected in parallel to said latch address inputs, said microprocessor comprising a control output connected to said ENABLE input; said microprocessor energizing in sequence said data outputs with the latch address input pattern corresponding to the desired digit, said control output, and said data outputs with the multi-segment code for the desired character.

4,511,895

METHOD AND APPARATUS FOR CONTROLLING DISTRIBUTED ELECTRICAL LOADS

Edward B. Miller, West Warwick, R.I., and Charles W. Eichelberger, Schenectady, N.Y., assignors to General Electric Company, Bridgeport, Conn.

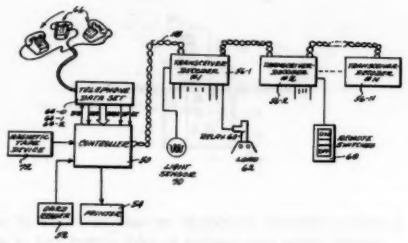
Division of Ser. No. 89,478, Oct. 30, 1979, abandoned. This application Nov. 24, 1981, Ser. No. 324,640
Int. Cl.³ H04Q *9/00*
U.S. Cl. 340—825.5 **18 Claims**

1. Apparatus at plural remote locations permitting non-interfering randomly occurring digital data communication between plural locations via a common data communications link, said apparatus being situated at each of said plural locations and comprising:

data transmitting means for serially transmitting digital binary bit information conveying signals having first and second states onto said communications link as described, one of said first and second states being dominant when transmitted on said link even if simultaneous transmission of the other state on the same link is attempted from

another location, said binary bit information conveying signals including unique duration or sequence patterns of said first and second states identifying respective ones of a plurality of output modes of said data transmitting means, said

arbitatration means for monitoring the existence of and first and second states on the link during the time required for the transmission of said binary bit of information, for



comparing the state value then being transmitted from its respective remote location with the state value then existing on said link, and for inhibiting further transmission of the data onto said link by its respective data transmission means if there is a difference between the value then being transmitted and the actual state then existing thus eventually leaving only one remote location transmitting on said link.

4,511,896

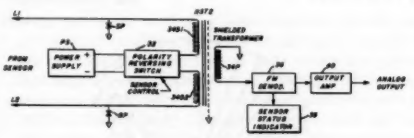
REMOTE SENSOR SYSTEM WITH BI-DIRECTIONAL MONITORING AND CONTROL OF OPERATION

Matthew E. Cousins III, Vienna, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 30, 1982, Ser. No. 403,686

Int. Cl.³ G08C *19/16*

U.S. Cl. 340—870.25 **7 Claims**



1. A system for transmitting electrical signals bi-directionally between a remote sensor unit which generates analog data signals and a control terminal unit along a single pair of transmission lines comprising:

power supply means within said control terminal unit for applying D.C. power of a predetermined polarity to said pair of transmission lines for providing D.C. bias to both said sensor unit and control terminal unit, said system operating in a monitoring mode of operation wherein analog data signals from said sensor unit are monitored at said control terminal unit when said power of a predetermined polarity is applied;

polarity reversing means coupled to said power supply means for selectively reversing the polarity of power supplied to said pair of transmission lines to switch said system to an adjustment mode of operation wherein said sensor unit is adjusted to a desired operating point;

adjustment means within said sensor unit responsive to said polarity reversal for initiating the adjustment of said sensor unit and terminating the adjustment at said operating point in response to a change in polarity back to said predetermined polarity; and

transmitter means within said sensor unit for sending said analog data signals detected by said sensor unit to said control terminal unit along the same single pair of transmission lines to which said D.C. power is applied during both said monitoring and adjustment modes of system operation.

4,511,897

SENSOR SYSTEM FOR METALLIC TARGETS INCLUDING DOPPLER RADAR AND RADIOMETER

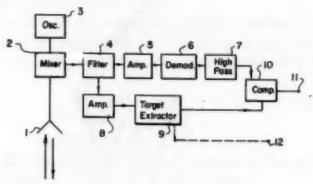
Kurt Lindner, Ulm, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,384

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1981, 3113472

Int. Cl.³ G01S *13/86*

U.S. Cl. 343—6 R **5 Claims**



1. A sensor system including a radiometric device, a Doppler radar device, and means for comparing signals obtained through said devices, characterized by a receiving circuit which is common to both said radiometric device and said Doppler radar device and which comprises an antenna, a mixer connected to said antenna, and a mixer oscillator connected to said mixer, and by a channel filter arrangement connected to said mixer, in which low frequency Doppler signals and high frequency radiometer signals contained in an output signal of said mixer are separately filtered out and supplied for signal processing and evaluation to separate devices comprising said radiometric device and said Doppler radar device, and wherein means for detecting quick changes in the radiometric signal are provided in said radiometric device.

4,511,898

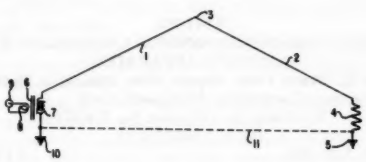
TERMINATED INVERTED V ANTENNA WITH MATCHING TRANSFORMER

Elmer R. Bush, Bethlehem, Pa., assignor to Timetco Corporation, Bristol, Pa.

Filed Jun. 22, 1983, Ser. No. 506,837

Int. Cl.³ H01Q *11/06*

U.S. Cl. 343—736 **5 Claims**



1. A wideband coaxial cable fed antenna system for continuous coverage of the 1.8 MHz to 30 MHz frequency spectrum comprising an antenna wire in an inverted V configuration having two wire segments sloping generally downward from an elevated middle portion of said antenna, a terminatng resistor connected between one end of said inverted V antenna wire and an electrical ground connection, and a radiofrequency transformer having a longitudinally laminated ferrite bar core of generally rectangular cross-section, a low impe-

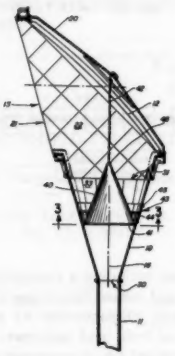
dance primary winding adapted for connection to a coaxial cable transmission line, and a high impedance secondary winding connected between the end of said inverted V antenna wire remote from said resistor terminated end and an electrical ground connection.

4,511,899

HORN-REFLECTOR MICROWAVE ANTENNA WITH INTERNAL DEBRIS TRAP

Eric L. Brooker, Hinsdale, Ill., assignor to Andrew Corporation, Orland Park, Ill.

Filed Dec. 27, 1982, Ser. No. 453,239
Int. Cl.³ H01Q *13/02*
U.S. Cl. 343—784 **6 Claims**



1. A horn-reflector microwave antenna comprising the combination of

a paraboloidal reflector for transmitting and receiving microwave signals,

a tapered feed horn extending downwardly from said reflector for guiding microwave signals to and from said reflector,

a waveguide connected to the lower end of said feed horn, and

a dielectric membrane extending across the interior of said feed horn for collecting any debris that falls down into said feed horn, wherein the outer periphery of said dielectric membrane is secured to the interior walls of said feed horn, and the central portion of said membrane is elevated above the periphery thereof so that debris collected on said membrane slides to the walls of said feed horn where the effect of such debris on the performance of the antenna is minimized.

4,511,900

CURRENT ENHANCED MONOPOLE RADIATION TYPE ANTENNA APPARATUS

Richard E. Deasy, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 10, 1982, Ser. No. 376,871
Int. Cl.³ H01Q *9/38*
U.S. Cl. 343—845 **8 Claims**

1. A system for generating a monopole radiation pattern comprising:

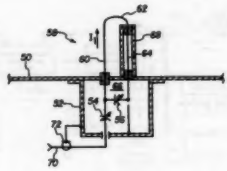
a ground plane having first and second sides;

an electrically short closed loop antenna including,

an input terminal positioned on said first side of said ground plane,

a first unshielded electrical conductor portion positioned on said second side of said ground plane and forming an antenna radiating portion, said first unshielded electrical conductor portion including first and second ends, said first end being electrically insulated from and extending through said ground plane and coupled to said input terminal,

a second electrical conductor portion positioned on said second side of said ground plane and electrically insulated from said ground plane and having a first end coupled to said second end of said first conductor portion and a second end electrically insulated from and extending through said ground plane, and



a return terminal positioned on said first side of said ground plane and coupled to said second end of said second conductor portion; and

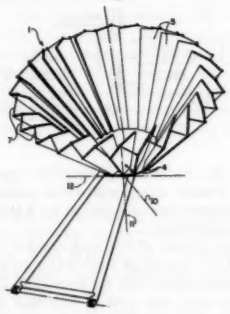
an electrically conductive non-radiating shield positioned on said second side of said ground plane and surrounding and electrically insulated from said second conductor portion, said electrically conductive shield being electrically connected to said return terminal.

4,511,901

DEVICE FOR CONNECTING AND GUIDING THE INDIVIDUAL COLLAPSIBLE ELEMENTS OF A RIGID, COLLAPSIBLE ANTENNA REFLECTOR

Manfred Westphal, Bermatingen, Fed. Rep. of Germany, assignor to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,093
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128926
Int. Cl.³ H01Q *15/20*
U.S. Cl. 343—915 **2 Claims**



1. A collapsible antenna relfector, comprising

a central panel having circular periphery;

a plurality of rigid tapered panels each having a lower edge, one end point of the edge being hingedly connected to the periphery of the central panel, for simultaneous rotating and pivoting so as to turn each panel and fold it outwardly from a folded position in what one longitudinal edge of each panel is situated on a cylinder surface; and

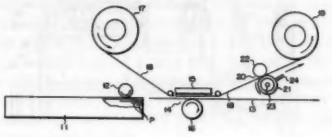
a plurality of rods, each being hinged with one end to one upper end point on said longitudinal edge of a panel of the plurality of panels, and being hinged with its other end to a mid point of an upper edge of an adjacent panel.

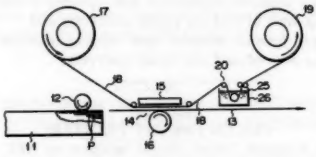
4,511,902

THERMAL TRANSFER TYPE PRINTING APPARATUS

Masayoshi Nagashima, Chigasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 16, 1983, Ser. No. 467,167
Claims priority, application Japan, Feb. 17, 1982, 57-24119
Int. Cl.³ G01D *15/10;* **B41J** *3/20, 31/00*
U.S. Cl. 346—76 PH **5 Claims**





1. A thermal transfer type printing apparatus which comprises:

means for conveying a paper sheet along a conveying path in a conveyance direction;

ribbon means for containing an ink medium formed with an ink layer;

a printing section arranged at said path and having thermal head means which contacts the ink layer of said ink medium contacted with said sheet and is driven in response to printing information for selectively and thermally transferring said ink layer onto said sheet in response to said information; and

erasing means for erasing at least blanks of the ink layer which correspond to said information remaining on said ink medium thus transferred so as to render said information illegible, said erasing means including a press roller in opposing relationship to a heat roller, said press and heat rollers arranged along said path downstream of said printing section, said ribbon means passing between said press and heat rollers so that said ink layer is in contact with said heat roller, said heat roller including heating means for heating and thus melting the ink layer of said ribbon means and being rotated in a direction opposite to said conveyance direction to generate friction between said ribbon means and said heat roller for increasing the erasing effect of said erasing means.

4,511,903

THERMAL PRINTER

Naoki Miyazaki, Suntoh; Keiichi Horiya, Numazu; Tsugio Shiozaki, Susono, and Kazuhide Takahama, Tagata, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1983, Ser. No. 542,670
Claims priority, application Japan, Oct. 18, 1982, 57-182291
Int. Cl.³ B41J *3/02*
U.S. Cl. 346—76 PH **6 Claims**

1. A thermal printer comprising:

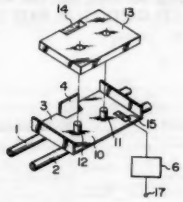
a platen to hold a paper;

a carriage moveable in reciprocating motion along the platen;

a thermal head attached to the carriage;

a ribbon cassette enclosing a printing ribbon coated with thermal fusible ink, said cassette being attachable to the carriage;

means for supplying a supply voltage to the thermal head to heat the thermal fusible ink or the paper;



a detector for detecting whether the ribbon cassette is attached to the carriage; and

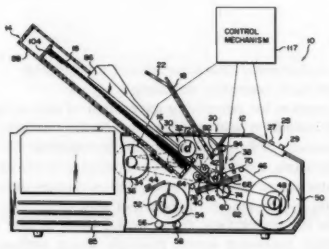
a driving voltage switching circuit for varying the supply voltage to the thermal head in response to the output of the detector in order to heat either the thermal fusible ink or the paper;

4,511,904

RECORDING APPARATUS

Tomohiko Takahashi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 14, 1983, Ser. No. 541,911
Claims priority, application Japan, Oct. 18, 1982, 57-156315[U]
Int. Cl.³ G01D *15/24;* **B65H** *1/00, 7/02;* **B41J** *13/10*
U.S. Cl. 346—134 **15 Claims**



1. A recording apparatus for recording information onto a sheet comprising:

a main body;

a printing means provided in said main body for effecting the printing onto said sheet;

a cassette for receiving the sheet provided separately from said main body;

a cassette-mounting means for mounting said cassette at a position located above said main body and obliquely with respect thereto;

a sheet feeding means for feeding said sheet received in said cassette toward said printing means;

a stopper means movably provided to said cassette in accordance with various size sheets received in said cassette, thereby setting said sheet into said cassette;

a sheet size regulating member connected to said stopper means and movably provided to a prescribed position in accordance with the movement of said stopper means,

a sheet size sensing means for sensing the size of the sheet received in said cassette provided to said cassette-mounting means and sensing the position of said sheet size regulating member and generating a detection signal; and

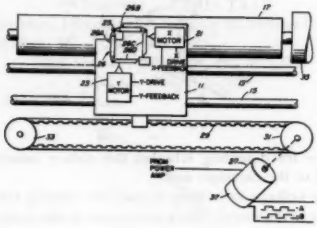
a display means for displaying the size of the sheet received in said cassette in accordance with the signal from said sheet size sensing means.

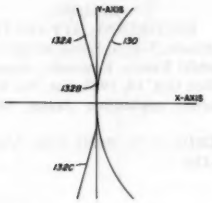
4,511,905

STYLUS RECORDER LINEARIZED DRIVE SYSTEM

Richard M. Ulvila, Salem, N.H., assignor to Centronics Data-Computer Corporation, Hudson, N.H.

Filed Sep. 30, 1982, Ser. No. 430,506
Int. Cl.³ G01D *15/18*; B41J *3/04*
U.S. Cl. 346—140 A **4 Claims**





1. A calligraphic character printer comprising:
a print head assembly including a stylus;
a suspension for permitting movement of said stylus relative the assembly, said suspension including at least a pair of generally orthogonal arms hinged together;
for each arm, a drive transducer operative to move the stylus along an arc having a substantial curvature defined essentially by the length of the other arm;
means for generating, from stored data, a pair of signals which represent stylus position along orthogonal axes relative said assembly;
for each drive transducer, servo amplifier means for energizing that drive transducer responsive to the respective position signal;
for each drive transducer, means for generating a compensation signal which is an function of the absolute value of the position signal corresponding to the other drive transducer and for mixing that compensation signal into the position signal which controls the energization of the respective drive transducer with a value to substantially offset the deviation from a straight line of said curvature.

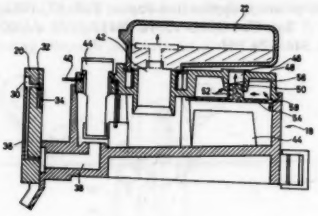
4,511,906

INK LIQUID RESERVOIR IN AN INK JET SYSTEM PRINTER

Takafumi Hara, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 5, 1983, Ser. No. 539,251
Claims priority, application Japan, Oct. 13, 1982, 57-154575[U]; Nov. 22, 1982, 57-176868[U]
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **6 Claims**

1. An ink liquid supply system for an ink jet system printer which includes a printer head mounted on a carriage, comprising:
an ink liquid reservoir mounted on said carriage, said ink liquid reservoir having a ceiling wall provided with an opening;
an ink cartridge removable mounted on said ink liquid reservoir;



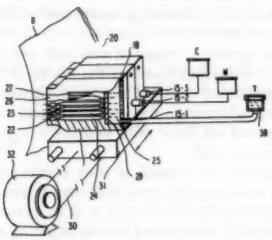
a capping member engaged in said opening formed in said ceiling wall of said ink liquid reservoir; and
a thin gap formed between said capping member and said ceiling wall of said ink liquid reservoir.

4,511,907

COLOR INK-JET PRINTER

Hiromichi Fukuchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 19, 1983, Ser. No. 543,546
Claims priority, application Japan, Oct. 19, 1982, 57-183220
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **7 Claims**



1. An ink-jet printer comprising:
a paper-feed control mechanism;
a printing mechanism containing print heads each Provided with a plurality of nozzles arranged vertically and substantially in the direction of paper feeding;
a carriage-feed control mechanism carrying said printing mechanism, moving at a constant speed in the horizontal direction, and outputting position detection signals;
a buffer circuit for temporarily storing input data transmitted from outside;
a dot pattern storage circuit for converting data output from said buffer circuit into a dot pattern and storing it;
a print head control circuit outputting timing signals for driving said print heads, in synchronization with the position detection signals output from said carriage-feed control mechanism;
a print head driving circuit unit for driving the print heads according to dot pattern data signals output from said dot pattern storage circuit, in synchronization with the timing signals from said print head control circuit;
a control unit for controlling all of said circuit units;
a first print head recording section being composed of said buffer circuit, said dot pattern storage circuit, said print head control circuit, said print head driving circuit, and a first print head mechanism wherein a plurality of nozzles

are arranged in the vertical direction substantially in the direction of paper feed;

a second print head recording section being composed of a second buffer circuit, a second dot pattern storage circuit, a second print head control circuit, a second print head driving circuit, a second print head mechanism wherein a plurality of nozzles are arranged in the vertical direction substantially in the direction of paper feed, and a delay memory circuit which is inserted between said second dot pattern storage circuit and said second print head control circuit and which generates a dot shift between the first print head mechanism acting as a baseline to the second print head mechanism in order to print and record dots at the same positions of and superimposed over dots printed and recorded on a sheet of paper by the first print head recording section; and

a third print head recording section having a similar circuit constitution to that of said second print head recording section, the delay memory circuit in said third print head recording section being a delay memory generating a dot shift from the first print head mechanism acting as a baseline to a third print head mechanism unit.

4,511,908

PLASTIC IDENTIFICATION CARD HAVING FORGERY PROTECTION WITH RESPECT TO EMBOSSED INFORMATION

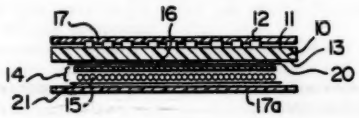
Edward A. Small, Nepean, Canada, assignor to British American Bank Note Inc., Ottawa, Canada

Filed Feb. 10, 1984, Ser. No. 579,013

Claims priority, application Canada, May 17, 1983, 428289

Int. Cl.³ B41M *5/16*

U.S. Cl. 346—206 **12 Claims**



1. An identification card comprising a core stock, having embossed information and at least one layer of chemicals reactive under pressure in registration with the embossments to form a coloured dye conforming with the original embossed information and a further formation of such dye when the embossed information is altered.

4,511,909

HEAT-SENSITIVE RECORDING MATERIALS

Naoto Arai, Osaka, Japan, assignor to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

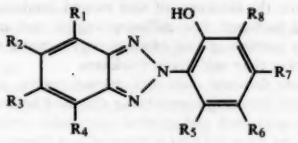
Filed Oct. 29, 1982, Ser. No. 437,857

Claims priority, application Japan, Nov. 17, 1981, 56-184862

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—208 **4 Claims**

1. A heat-sensitive recording material comprising a support having a recording layer provided thereon, said recording layer comprising (a) a colorless or pale-colored basic dye selected from the group consisting of 3-(N-ethyl-p-toluidino)-6-methyl-7-phenylaminofluoran, 3-(N-ethyl-p-toluidino)-6-methyl-7-(p-toluidino)fluoran, 3-diethylamino-6-methyl-7-phenylaminofluoran, 3-diethylamino-7-(2-carbomethoxyphenylamino)fluoran, 3-(N-cyclohexyl-N-methylamino)-6-methyl-7-phenylaminofluoran, 3-pyrrolidino-6-methyl-7-phenylaminofluoran, 3-piperidino-6-methyl-7-phenylaminofluoran, 3-diethylamino-6-methyl-7-xylidinofluoran, 3-pyrrolidino-6-methyl-7-p-butylphenylaminofluoran, and 3,3-bis-(p-dimethylaminophenyl)-6-dimethylaminophthalide, (b) a color developing material, and (c) at least one heat-fusible material represented by the formula (I):



(I)

wherein R_1 to R_8 independently represent a hydrogen atom, a halogen atom, an alkyl group having 1 to 8 carbon atoms, an alkoxy group having 1 to 8 carbon atoms, a phenyl group, a benzyl group, or a benzyloxy group, and wherein the ratio by weight of said at least one heat-fusible material to said developing material is at least 1 to 10.

4,511,910

THERMOSENSITIVE RECORDING MATERIAL

Keishi Taniguchi, Shizuoka, and Kiyotaka Iiyama, Mishima, both of Japan

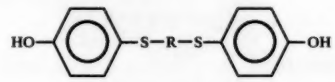
Filed Apr. 12, 1984, Ser. No. 599,408

Claims priority, application Japan, Apr. 16, 1983, 58-67520; Oct. 20, 1983, 58-196798

Int. Cl.³ B41M *5/18, 5/22*

U.S. Cl. 346—216 **5 Claims**

1. In a thermosensitive recording material comprising a colorless or light-colored coloring material, and a color developer capable of inducing color formation in said colorless or light-colored coloring material upon application of heat thereto, the improvement wherein said color developer is a phenolic material of the formula



wherein R represents an straight-chain or branched alkylene group having at least one hydroxyl group.

4,511,911

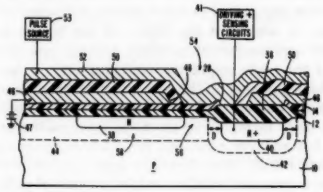
DENSE DYNAMIC MEMORY CELL STRUCTURE AND PROCESS

Donald M. Kenney, Shelburne, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 22, 1981, Ser. No. 286,110

Int. Cl.³ H01L *29/78, 27/02, 29/34, 27/10*

U.S. Cl. 357—23.6 **9 Claims**



1. A memory cell comprising;

a semiconductor substrate of a first conductivity type having spaced apart storage node and bit/sense line diffusion regions of a second conductivity type defining a channel region,

a first insulating layer having a given substantially uniform thickness disposed over said storage node diffusion region and extending over a first portion of said channel region,

a second insulating layer disposed over said bit/sense line diffusion region and extending over the remaining portion

of said channel region adjacent said bit/sense line diffusion region, the thickness of said second insulating layer over said bit/sense line diffusion region and over the remaining portion of said channel region being substantially thicker than said given thickness,

a control gate disposed over said channel region, said first and second insulating layers being disposed between said channel region and said control gate, said control gate being spaced from the first portion of said channel region by a distance equal to the thickness of said first insulating layer and from the remaining portion of said channel region and from said bit/sense line diffusion region by a distance equal to the thickness of said second insulating layer, and

conducting means disposed over said first and second insulating layers and insulated from said control gate, said conducting means having an opening over said channel region.

4,511,912

SEMICONDUCTOR ELEMENT

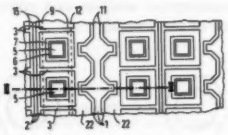
Peter Mahrla, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

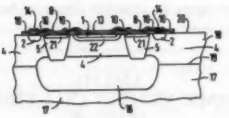
Filed Aug. 5, 1981, Ser. No. 290,332

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035462

Int. Cl.³ H01L *29/72*

U.S. Cl. 357—36 **3 Claims**





1. Integrated power transistor arrangement with several bipolar parallel connected partial power transistors in which, on a semiconductor substrate an epitaxial layer is provided, which forms the partial power transistors in respective collector zones, in which, in the region of the border-surface between the semiconductor substrate and the epitaxial layer, is provided for each respective collector zone a buried layer zone, which projects all the way to collector contact regions, the collector contact regions reaching from the surface of the epitaxial layer facing away from the semiconductor substrate into the buried layer zone, and in which, in the epitaxial layer on the side facing away from the semiconductor substrate, a base zone is provided which is part of the partial power transistors and in the base zone is provided a common emitter zone for the partial power transistors; and in which is connected to each respective base a barrier resistance which is integrated with the base, the power transistor arrangement which comprise base barrier resistances which are formed in such a way that the base common to the partial power transistors extends from an active base region which lies below the zones forming the emitter for the partial power transistors, and has strip-shaped regions which project through bounded regions of the epitaxial layer which in each case, respectively, form a collector contact region for a partial power transistor and that the strip-shaped regions of the base zone on the side of the collector contact regions facing away from the emitter zone have a common base contact.

4,511,913

GATE-TURN OFF THYRISTOR WITH OPTIMIZED ANODE SHORTING RESISTANCE, R_{SO}

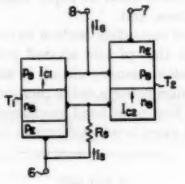
Takahiro Nagano, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

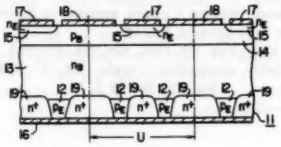
Continuation-in-part of Ser. No. 13,808, Feb. 22, 1979, abandoned. This application May 27, 1981, Ser. No. 267,676

Claims priority, application Japan, Feb. 22, 1978, 53-18484

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—38 **10 Claims**





1. A semiconductor switching device having a gate turn-off capability, comprising:

a semiconductor substrate including at least one gate turn-off thyristor unit comprising four semiconductor layers with alternately different conductivity types, a first main electrode kept in ohmic contact with a first outermost semiconductor layer of said four semiconductor layers, a control electrode kept in ohmic contact with a first inner semiconductor layer of said four semiconductor layers adjacent to said first outermost semiconductor layer, and a second main electrode kept in ohmic contact with a second outermost semiconductor layer of said four semiconductor layers and with an exposed area of a second inner semiconductor layer of said four semiconductor layers adjacent to said second outermost semiconductor layer, wherein a short-circuiting resistance $R_{SO}(\Omega \cdot cm^2)$ between (a) an area on a first surface of the second inner semiconductor layer adjacent to the first inner semiconductor layer which area is a projection of said first outermost layer on said first surface of the second inner semiconductor layer and (b) said exposed area of said second inner semiconductor layer which is in contact with said second main electrode satisfies the following inequality in thermal equilibrium:

$$R_{SO\ min} < R_{SO} < R_{SO\ max},$$

where $R_{SO\ min}$ and $R_{SO\ max}$ are the lower and upper limits of R_{SO}, respectively, and $R_{SO\ min}$ and $R_{SO\ max}$ are also represented by the following expressions:

$$R_{SO\ min} = 0.498\ (\log \tau_{B1} - 0.54)^{-1/7} \cdot \rho_n W \text{ and}$$

$$R_{SO\ max} = 3.937\ (\log \tau_{B1} - 0.654)^{-0.3} \cdot \rho_n W,$$

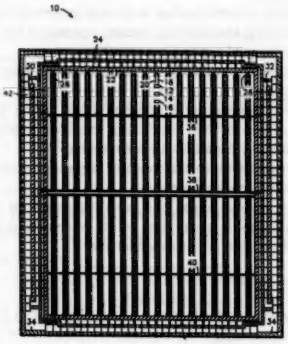
where W and ρ_n are the thickness (cm) and the resistivity (Ω-cm) of said second inner semiconductor layer respectively and τ_{B1} is the life-time (μsec) of the carrier in said second inner semiconductor layer.

4,511,914

POWER BUS ROUTING FOR PROVIDING NOISE ISOLATION IN GATE ARRAYS

James J. Remedi, Austin; Don G. Reid, Round Rock, and Lynette Ure, Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1982, Ser. No. 394,239
Int. Cl.³ H01L *27/02, 27/10, 23/48, 27/15*
U.S. Cl. 357—45 **9 Claims**



1. A gate array having power bus routing for providing noise isolation, comprising:

n columns of a plurality of transistor cells, where n is an integer, each of said n columns of transistor cells having first and second power busses extending substantially along each of the n columns and coupled to predetermined ones of the transistor cells;

first and second input/internal power busses coupled to said first and second power busses of each column, respectively, and extending substantially around the perimeter of said n columns, for providing power to each transistor cell of said n columns;

at least one power strip extending substantially perpendicular to said n columns of transistor cells, coupling each of said pair of input/internal power busses to a predetermined one of said first and second power busses of one or more columns, for providing increased current to said plurality of transistor cells; and

output power busses positioned along the outer perimeter of said gate array, for providing power busses for output cells along one or more sides of the gate array which are separate from the internal power busses to keep external current spikes from being coupled into the array.

4,511,915

COLOR TELEVISION ENCODING CIRCUIT

Nicolaas J. L. Van der Valk; Antonius G. Moelands, and Peter C. Schmale, all of Breda, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 12, 1983, Ser. No. 457,610
Claims priority, application Netherlands, Jan. 14, 1982, 8200127
Int. Cl.³ H04N *9/46, 5/06*
U.S. Cl. 358—17 **6 Claims**

1. A color television encoding circuit for use in a television system of the NTSC or PAL standard, comprising:

a first oscillator for generating a chrominance subcarrier signal having a frequency stability prescribed by one of said standards;

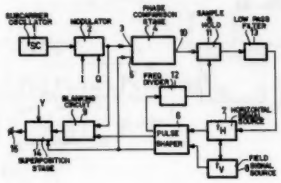
a second oscillator for generating a line frequency signal;

a pulse circuit for generating a composite synchronizing signal;

a modulator circuit for modulating the chrominance subcarrier signal to generate a chrominance signal;

a signal control loop for adjusting the phase and frequency of the second oscillator, including:

a phase comparison stage having first and second input terminals for receiving the chrominance signal and composite synchronizing signal, respectively, and an output terminal, said stage detecting during operation the difference of the phase of the chrominance subcarrier signal with respect to the zero value at the instant at which the leading edge of the synchronizing pulse reaches half the amplitude thereof, and



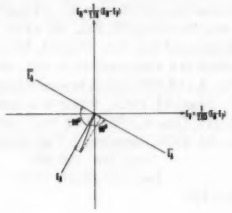
a sample and hold circuit connected to said phase comparison stage output terminal and said second oscillator, said sample and hold circuit sampling once per 2n line periods, where n is an integer, to produce a control signal for said second oscillator frequency.

4,511,916

METHOD AND DEVICE FOR CORRECTING CHROMINANCE SIGNAL

Ryo Fujimoto, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 478,889
Claims priority, application Japan, Apr. 7, 1982, 57-57936
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—28 **10 Claims**



1. A method for correcting a chrominance signal, comprising steps of:

(a) obtaining a carrier chrominance signal by modulating a carrier with an input chrominance signal;

(b) taking out from said input signal a first hue component which is of a phase differing about plus 90° from the phase of a specific color relative to the carrier and a second hue component which is of a phase differing about minus 90° from the phase of the specific color;

(c) determining the magnitudes of said first and second hue components; and

(d) correcting said carrier chrominance signal when the magnitudes of said first and second hue components are determined to be less than a prescribed value.

4,511,917

DETERMINING AGREEMENT BETWEEN AN ANALYSIS SIGNAL AND AT LEAST ONE REFERENCE SIGNAL

Hans O. Köhler, Lilla vägen 10, s-142 00 Trångsund, Sweden, and Sten K. Strömvall, Farsta, Sweden, assignors to Hans Olof Kohler, London, England

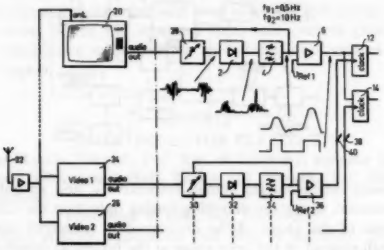
PCT No. PCT/SE82/00339, § 371 Date Jun. 20, 1983, § 102(e) Date Jun. 20, 1983, PCT Pub. No. WO83/01526, PCT Pub. Date Apr. 28, 1983

PCT Filed Oct. 20, 1982, Ser. No. 514,808

Claims priority, application Sweden, Oct. 20, 1981, 8106186

Int. Cl.³ H03K 5/26; H04N 7/02

U.S. Cl. 358—84 **10 Claims**



1. A method of determining concordance of an analysis signal with at least one reference signal comprising forming smoothed envelopes of the analysis signal and the reference signal, generating a pulse train for each of the smoothed envelopes comprising pulses which have a duration determined by the time of a predetermined relationship of the envelopes, above or below a threshold signal, said pulse trains respectively representing the analysis signal and the reference signal, and subsequently registering the simultaneous occurence of pulses in the two trains in a predetermined number of consecutive comparisons made each time a pulse occurs in the reference signal pulse train constituting the criterion for the analysis signal and the reference signal being in concordance.

4,511,918

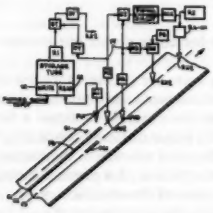
SCANNING APPARATUS AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08841

Division of Ser. No. 013,608, Feb. 16, 1979, Pat. No. 4,338,626, which is a division of Ser. No. 778,331, Mar. 16, 1977, Pat. No. 4,148,061, which is a continuation of Ser. No. 254,710, May 18, 1972, Pat. No. 4,118,730, which is a continuation-in-part of Ser. No. 267,377, Mar. 11, 1963, which is a continuation-in-part of Ser. No. 626,211, Dec. 4, 1956, Pat. No. 3,081,379, and Ser. No. 477,467, Dec. 24, 1954, abandoned. This application Jul. 2, 1982, Ser. No. 394,946

Int. Cl.³ H04N 7/18

U.S. Cl. 358—107 **46 Claims**



1. An automatic scanning system comprising:

(a) a beam scanning device,

(b) means for locating an image field to be scanned in the scanning field of said device,

(c) means initiating scanning and causing the beam to scan in a predetermined path across the field to be scanned,

(d) said beam device including means for producing an output signal derived from scanning and modulating said signal in accordance with variations in light intensity of the field scanned,

(e) a storage tube having a writing means and a reading means connected to its output,

(f) said writing means including beam means for storing said input signal,

(g) means passing the output of said beam scanning device to the input of said storage tube to effect storage of said output signal,

(h) recording means having a movable recording member and recording transducing means operative for recording signals onto said recording member,

(i) said recording transducing means being adapted to receive signals generated on the output of said storage tube,

(j) means for generating a control signal when a predetermined portion of said recording member is aligned with said recording transducing means, and

(k) means responsive to said control signal for activating said storage tube reading means,

(l) whereby after a signal has been recorded on its storage means, a signal is generated on its output which signal is recorded on said recording member.

4,511,919

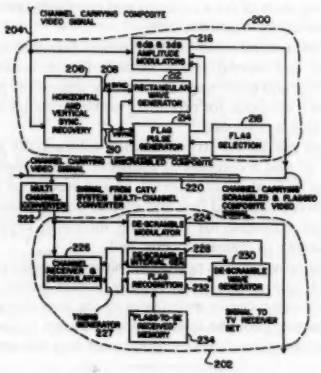
METHOD AND APPARATUS FOR SCRAMBLING AND DESCRAMBLING VIDEO SIGNALS IN A MULTICHANNEL SYSTEM

James Forgey, Seattle, Wash., and Donald Kirk, Jr., Gainesville, Fla., assignors to Hamlin International Corp., Seattle, Wash.

Filed Dec. 1, 1981, Ser. No. 326,441

Int. Cl.³ H04N 7/16

U.S. Cl. 358—120 **3 Claims**



1. In a video communication system which provides an unscrambled composite video signal having a video information signal interrupted by (1) amplitude-detectable horizontal sync pulses occurring within a horizontal blanking interval which follows the scan of a horizontal line and (2) periodic sets of pulses, each such set including vertical sync pulses and occurring within a vertical blanking interval which follows the scan of a predetermined fixed number of horizontal lines, apparatus for limiting access by a receiver set to the video information contained within the video information signal of the unscrambled composite video signal, the apparatus comprising:

a scrambler having the unscrambled composite video signal as an input, the scrambler comprising:

amplitude modifying means for (a) reducing the amplitude of predetermined horizontal sync pulses to levels indistinguishable from the amplitude of the video information signal of the unscrambled composite video signal and (b) maintaining the amplitude of (1) at least some of the pulses occurring during each vertical blanking interval and (2) substantially all of the video information signal, the scrambler thereby providing a selectively suppressed scrambled composite video signal as an output; and

a descrambler connected to receive the scrambled composite video signal as input, the descrambler comprising:

means for deriving the time intervals of the amplitude-reduced horizontal sync pulses from the amplitude-maintained pulses occurring within the vertical blanking intervals,

said video communication constituting a system wherein each periodic set of pulses includes a fixed number of adjacent broad pulsewidth vertical sync pulses and a plurality of narrow pulsewidth equalizing pulses, the scrambler further comprising:

(a) means for determining a time period which contains a plurality of equalizing pulses, at least some of which are adjacent in time;

(b) means for dividing the intervals between at least two adjacent equalizing pulses in the determined time period into time slots; and

(c) flagging means for selecting one of a plurality of broadcast identifier flags and for generating a flag pulse during one of the time slots, the flag pulse in the time slot corresponding to the selected identifier flag,

said flagging means further comprising:

means for inserting the generated flag pulses into the selectively suppressed composite video signal when (a) the flag pulse occurs during a preselected time slot between two equalizing pulses, (b) the preselected time slot occurs during the determined time period, and (c) the determined time period occurs within a fixed relative time interval during each vertical blanking interval,

said flag inserting means further comprising:

modulator means for effecting a relative increase in the selectively suppressed scrambled composite video signal during the presence of an inserted flag pulse,

said time interval deriving means comprising:

means for producing a reference pulse at substantially the same relative time during each vertical blanking interval,

said reference pulse producing means comprising:

(a) means for integrating the vertical sync pulses;

(b) means for comparing the output of the integrating means with a threshold level which is less than the maximum output integrated by the integrating means; and

(c) means for signalling when the output of the integrating means exceeds the threshold level,

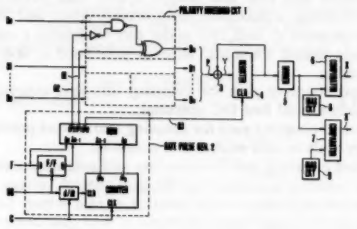
(d) means, receiving the scrambled composite video signal as input, for providing a pip signal in response to either only the rising edge or falling edge of each pulse in the srambled video signal; and

(e) means, having as inputs the output of the pip signal providing means and the output of the integrating means, for generating a pulse output when a pip from the pip providing means is first provided after the signalling means indicates that the threshold level has been exceeded.

4,511,920
TELEVISION SIGNAL AMPLITUDE DETECTION CIRCUIT

Yukihiko Iijima, and Sadame Kobayashi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1982, Ser. No. 400,147
Claims priority, application Japan, Jul. 22, 1981, 56-113624
Int. Cl.³ H04N 7/02
U.S. Cl. 358—139 4 Claims

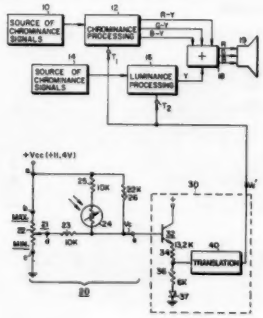


1. A television synchronizing signal amplitude detection circuit for detecting the amplitude of an input composite television signal comprising a first detection circuit for detecting the sync signal amplitude from the difference between an average of a first level and an average of a second level in a detection interval including a vertical sync pulse period and an equalizing pulse period preceding or succeeding said vertical sync pulse period of the television signal, and a second detection circuit for determining whether said sync signal amplitude detected by said first detection circuit is within a predetermined permissible range, the detection output of said second detection circuit being representative of detection as to whether the amplitude of the composite television signal is within a permissible range.

4,511,921
TELEVISION RECEIVER WITH MANUAL AND SELECTIVELY DISABLED AUTOMATIC PICTURE CONTROL

Wayne E. Harlan, and James C. Marsh, Jr., both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,971
Int. Cl.³ H04N 5/58, 9/535
U.S. Cl. 358—161 9 Claims



1. In a video signal display system including a signal processing channel; an imange reproducing kinescope for producing an image display on a viewing screen thereof in response to output signals from said signal processing channel; and a light responsive variable conduction device positioned with respect to said kinescope viewing screen such that substantially pro-

portional amounts of ambient light strike said light responsive device and said kinescope viewing screen; a source of variable DC gain control voltage for controlling the gain of said signal processing channel, comprising:

a first DC operating potential;

a second DC operating potential;

a manually adjustable potentiometer including a resistance between first and second nodes, and an adjustable wiper slideably connected to said resistance and adjustable between said first and second nodes; said potentiometer exhibiting a maximum gain setting when said wiper is positioned at said first node, and exhibiting a minimum gain setting when said wiper is positioned at said second node;

a first coupling path for coupling said first potentiometer node to said first DC potential;

a second coupling path for coupling said second potentiometer node to said second DC potential;

a third coupling path for coupling said potentiometer wiper at which a manually variable gain control voltage is produced according to the position of said wiper, to a gain control voltage output terminal of said gain control voltage source; and

a variable impedance network, including said light responsive device, coupled from said first operating potential to said third coupling path; wherein

(a) the impedance of said first coupling path is significantly less than the effective impedance of said variable impedance network when said wiper is positioned at said first potentiometer node to produce a maximum gain condition, and

(b) the impedance between said output terminal and said second operating potential is significantly greater than the effective impedance of said variable impedance network when said wiper is positioned at said first potentiometer node to produce a maximum gain condition, such that the gain control voltage at said output terminal is substantially unaffected by variations in the conductivity of said light responsive device in response to varying ambient light levels when said wiper is positioned at said first potentiometer node.

4,511,922

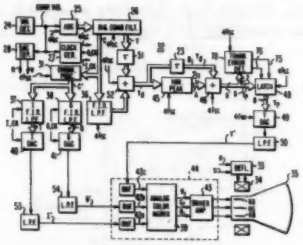
DIGITAL TELEVISION SYSTEM WITH TRUNCATION ERROR CORRECTION

Henry G. Lewis, Jr., Hamilton Square, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 21, 1982, Ser. No. 435,777

Int. Cl.³ H04N *5/14*

U.S. Cl. 358—166 **5 Claims**



1. A digital television signal processing system with truncation error, correction, comprising:

means for supplying first digital samples containing picture information;

a digital processor operating on said first digital samples to derive therefrom second digital samples that contain picture information that is modified from the picture information contained in said first digital samples, said digital processor including within its processing chain a processing stage that produces an output digital word that is subject to truncation error when said digital processor is supplied with selected ones of said first digital samples such that said truncation error results in the derivation of second digital samples containing erroneously modified picture information;

means coupled to said digital processor for detecting the truncation error produced by said processing stage; and

means coupled to said truncation error detecting means for changing said second digital samples upon the detection of said truncation error to different samples that contain picture information corrected for the effects of said truncation error,

wherein said processing stage includes an adder that develops said output digital word such that said adder produces one of an overflow and underflow condition upon the occurrence of said truncation error and wherein said second digital sample changing means includes a latch that receives said output digital word and passes it to a subsequent processing stage such that upon the detection of said truncation error said latch passes a modified output digital word corrected for the effects of said truncation error.

4,511,923

METHOD FOR TUNING THE INPUT STAGE OF A RECEIVER TO A DESIRED RECEIVING FREQUENCY AND CIRCUIT ARRANGEMENT FOR CARRYING OUT THE METHOD

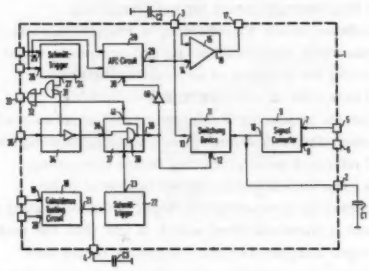
Laslo Götz, Freising, Fed. Rep. of Germany, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 12, 1981, Ser. No. 320,896

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3043103; Nov. 20, 1980, 3043768

Int. Cl.³ H04N *5/44*

U.S. Cl. 358—191.1 **23 Claims**

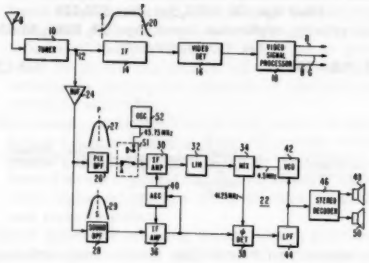


1. Method for tuning the input stage of a receiver to a desired transmission frequency in which a tuning signal whose duty cycle represents a received frequency is converted to a d.c. tuning voltage which is applied to the input stage for the tuning, wherein the instantaneous d.c. level of the tuning voltage applied during the tuning operation to the input stage is stored, and after completion of the tuning operation the application of the tuning voltage to the input stage is interrupted and the previously stored instantaneous d.c. level of the tuning voltage is applied to the input stage.

4,511,924
FREQUENCY TRANSLATION PHASE-LOCKED LOOP FOR SEPARATE OR INTERCARRIER TYPE TELEVISION SOUND DETECTION

Patrick D. Griffis, and Abraham E. Rindal, both of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 29, 1982, Ser. No. 437,833
Int. Cl.³ H04N 5/62
U.S. Cl. 358—197 **5 Claims**



1. In a television system including a source of an intermediate frequency (IF) signal having an IF picture carrier amplitude modulated with video information and an associated IF sound carrier frequency modulated with audio information, apparatus for detecting said audio information comprising:

a frequency translation phase-locked loop (PLL) for producing at an output said audio information, said frequency translation PLL including a phase detector having a first input coupled to be responsive to said frequency modulated sound carrier, a second input and an output for providing said audio information;

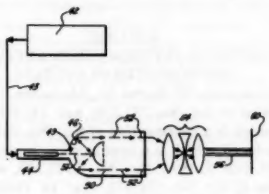
an oscillator for producing an oscillator signal; and

a switching means coupled to be responsive to said amplitude modulated picture carrier and said oscillator signal for selectively causing said second input of said phase detector to be responsive to either said amplitude modulated picture carrier or said oscillator signal.

4,511,925
HIGH INTENSITY ULTRAVIOLET LIGHT VIDEO IMAGING APPARATUS

Joseph R. Mackenroth, III, 8117 McArthur Dr., Harahan, La. 70123

Filed Aug. 16, 1982, Ser. No. 408,429
Int. Cl.³ G03B 27/70; H04N 5/76
U.S. Cl. 358—244 **15 Claims**



1. An ultraviolet, video imaging tube for printing on vesicular microfilm, diazo microfilm, and diazo paper and like medium comprising:

a. housing means having an outer wall defining therewithin an interior;

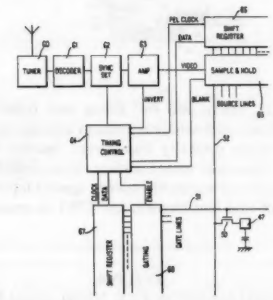
b. electron gun means penetrating the housing wall for emitting scanning electrons into the housing means across a path intersecting the interior of the housing means; and

c. ultraviolet phosphor target means disposed within the housing means interior, and positioned on said path for converting the scanning electrons into a reflected high intensity, ultraviolet video image which can print upon an ultraviolet sensitive medium.

4,511,926
SCANNING LIQUID CRYSTAL DISPLAY CELLS

William A. Crossland, Harlow; Peter W. Ross, and Peter J. Ayliffe, both of Bishop's Stortford, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 31, 1983, Ser. No. 481,050
Claims priority, application United Kingdom, Apr. 1, 1982, 8209708
Int. Cl.³ H04N 5/66
U.S. Cl. 358—236 **5 Claims**



1. A method of operating a matrix array liquid crystal display device including a liquid crystal layer sandwiched between a transparent front sheet provided with an electrode and a rear sheet provided with a matrix array of electrode pads that define respective picture elements, and an access circuitry including a matrix array of gates individually connected to the electrode pads and operative for supplying selected potentials thereto in accordance with the information to be displayed, comprising the steps of:

maintaining the front sheet electrode at a substantially constant reference potential;

repetitively addressing each of the electrode pads via the associated gate;

supplying the selected potential to the respective electrode pad through the associated gate during said addressing step;

closing the associated gate after said addressing step for a predetermined period of time;

opening the associated gate at least once following said predetermined period of time;

discharging the respective electrode pad with respect to the front sheet electrode during said opening step through the associated gate; and

reclosing the associated gate after said discharging step until the next following addressing step.

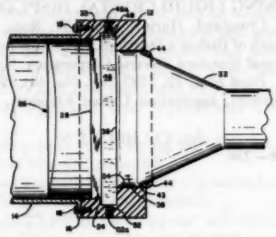
4,511,927
LIQUID COUPLING SYSTEM FOR VIDEO PROJECTORS

Michael T. Bauer, Welborn, Fla., assignor to National Viewtech Corp., Patchogue, N.Y.

Filed Jan. 10, 1983, Ser. No. 456,806
Int. Cl.³ H04N 5/72, 5/65, 5/74
U.S. Cl. 358—250 **5 Claims**

1. Apparatus for optically coupling a projection lens to the face of a CRT comprising coupling cell means, lens means mounted on one side of said cell means, and a recess in said cell means to accommodate a lens element of said lens means, a

recess formed on the oppositely facing side of said cell means to accommodate the screen surface of a CRT, a liquid chamber formed within said cell means for communicating with both said lens element and said screen surface of said CRT, coupling liquid having the ability to absorb x-rays being a substantially saturated solution of a halide selected from the group consist-



ing of $BaCl_2$, $SrCl_2$, and BaI filling said liquid chamber in intimate contact with said lens element and said screen surface, said liquid being optically transparent thereby providing an optical path from said screen surface through said lens element free of air gaps and means for sealing against liquid leakage the perimeters of said lens element and CRT in contact with said cell means.

4,511,928

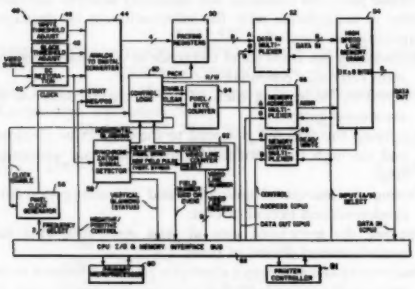
SYSTEM AND METHOD FOR HIGH QUALITY IMAGE REPRODUCTION WITH GRAYSCALE IMAGE PRINT WHILE STORE CAPABILITY

Denis G. Colomb, Boca Raton, Fla., assignor to Sonics Research Corporation, Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 182,886, Aug. 29, 1980, Pat. No. 4,345,276. This application Aug. 16, 1982, Ser. No. 408,567

Int. Cl.³ H04N *1/40, 1/32*

U.S. Cl. 358—280 **15 Claims**



1. A method of reproducing images on a printer in printed form, said method comprising the steps of:

(a) receiving digital image data corresponding to said images to be reproduced;

(b) storing said digital image data corresponding to said images to be reproduced in a first storage area;

(c) transferring digital image data, corresponding to images to be printed, from said first storage area to a second storage area;

(d) simultaneously with step (b), reading out stored digital image data from said second storage area, and providing same to said printer; and

(e) printing said images in correspondence to said digital image data provided to said printer;

wherein steps (a), (b) and (c) are carried out by a primary microprocessor, and step (d) is carried out by a printer control microprocessor.

4,511,929

PICTURE IMAGE INFORMATION RECORDING APPARATUS

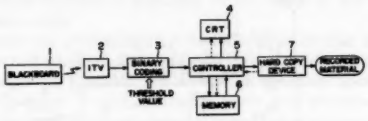
Masatoshi Maeda, Kawasaki; Junji Katsurai, Hachioji, and Hiroaki Ikeda, Tachikawa, all of Japan, assignors to Konishiroku Photo Industry Co. Ltd., Tokyo, Japan

Filed Apr. 26, 1982, Ser. No. 372,225

Claims priority, application Japan, Apr. 29, 1981, 56-65447

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—296 **5 Claims**



1. An apparatus for recording picture image information from a large image field comprising:

a picture image information input device for scanning and reading in succession each of a plurality of frames dividing the large image field;

a binary coding device for coding the picture image information obtained by said scanning and reading into binary image information;

a memory device comprising a plurality of memory sections each corresponding to a respective one of said plurality of frames for storing the binary image information corresponding to the respective frames;

a display device for displaying a picture image from said binary image information;

a controller device for controlling a display on one portion of said display device of at least part of the binary image information stored in one memory section corresponding to one frame of said image field, and the display on another portion of said display at least part of the binary image information of another memory section corresponding to another frame;

means for adjusting the displayed portions such that the picture images of the frames are aligned, and means for adjusting the binary image information stored in said memory device to correspond with aligning said frames; and

a hard copy device for producing a hard copy output of combined frames of the entire image field from the adjusted binary image information in said memory device.

4,511,930

ELECTRO-OPTICAL INFORMATION RECORDING AND REPRODUCTION SYSTEM

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation of Ser. No. 257,376, Apr. 24, 1981, Pat. No. 4,398,223, which is a continuation of Ser. No. 951,763, Oct. 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 654,939, Feb. 3, 1976, Pat. No. 4,121,249, which is a continuation of Ser. No. 474,932, Mar. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 277,401, Aug. 2, 1972, Pat. No. 3,818,500, and Ser. No. 277,402, Aug. 2, 1972, abandoned. This application Aug. 3, 1983, Ser. No. 519,979

The portion of the term of this patent subsequent to Oct. 17, 1995, has been disclaimed.

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—335 **18 Claims**

1. A system for recording and reproducing video information comprising in combination:

a record member,

first means operable to generate video picture signals each of

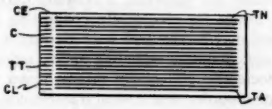
which signals defines at least one full frame of video information,

first control means for controlling said first means to generate frame video picture signals,

second means including a writing radiation beam generating means operable for generating and controllably directing a narrow beam of recording radiation of sufficient intensity to effect a recording in said record member by varying the physical structure of portions of said record member intersected by said beam and means for receiving a frame video picture signal from said first means and modulating said radiation beam in accordance with the characteristics of the picture signal generated to permit said beam to record the picture information in said record member by varying the structure of said portions intersected by said beam,

third means operatively located with respect to said second means for prepositioning a record member containing a plurality of parallel record tracks with respect to said second means to permit said second means to record frame video signal information along selected record tracks of said record member,

fourth means for effecting lateral relative positioning of a record member and said second means to dispose the scanning axis of said narrow beam of radiation in alignment with a selected narrow track of said record member,



fifth means for effecting relative movement between said record member and said beam of radiation to cause said beam to scan said selected track,

sixth means for activating said first control means to cause said first means to generate an output signal representative of the information contained in the field scanned when said fourth means is operated to effect the relative positioning of said scanning axis of said beam of recording radiation with a selected track of said record member wherein the video signal generated is employed to modulate said beam as it scans said selected track and said beam records the information defined by said signal output by said first means along an area of the selected track of the card which area is no wider than the width of said narrow beam scanning said selected track,

seventh means including means for generating a beam of reading radiation for reading information recorded by said means and generating information signals defining the video information read by said reading radiation,

eighth means for controlling the operation of said third, fourth and fifth means to cause said record member and said reading radiation beam to effect controlled relative movement whereby said reading radiation beam scans selected information recorded on said record member by said recording radiation beam, and

means for receiving and transducing the information signals generated by said seventh means to a visually monitorable form.

4,511,931

SLOW MOTION USING LONGITUDINAL RECORDING AND FORWARD/REVERSE TAPE TRANSPORTATION

James A. Bixby, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

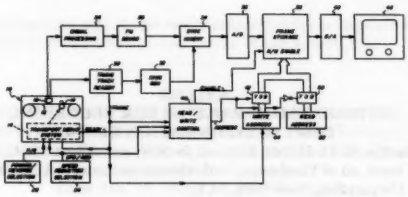
Filed Jul. 28, 1980, Ser. No. 172,915
Int. Cl.³ H04N *5/782*
U.S. Cl. 360—10.3 **7 Claims**

1. Apparatus for use in providing a slow motion display of scene information recorded on a magnetic recording medium in the form of a plurality of frames of time sequential scene information, the magnetic recording medium being transportable in a reverse direction and in a forward direction, said apparatus comprising:

(a) means for playing back information from said magnetic recording medium upon the transportation of said magnetic recording medium in the forward direction;

(b) means for repeatedly transporting said magnetic recording medium in accordance with a transport cycle wherein said magnetic recording medium is transported in the reverse direction and then in the forward direction to effect playback of a frame of scene information during each transport cycle;

(c) a frame storage device cooperative with said means for playing back information for storing a frame of scene



information as it is played back from said magnetic recording medium by said playback means; and

(d) means cooperative with said frame storage device for continuously reading out information stored by said frame storage device,

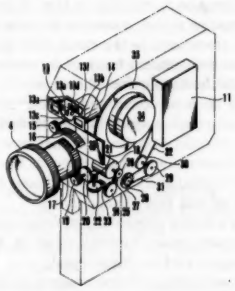
said transport means including means for selectively transporting said magnetic recording medium during each transport cycle a distance D_F in the reverse direction and a distance D_F+D_T in the forward direction, where D_T is nominally equal to the distance said magnetic recording medium must be transported in the forward direction to effect playback of a single frame of scene information, thereby resulting in playback of frames of scene information in slowed chronological order that depends on the repetition rate of said means for repeatedly transporting said magnetic recording medium.

4,511,932

VIDEO RECORDING CAMERA

Tatsuzo Ushiro, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1982, Ser. No. 388,248
Claims priority, application Japan, Jun. 24, 1981, 56-97916
Int. Cl.³ H04N *5/78, 5/91, 5/26*
U.S. Cl. 360—33.1 **17 Claims**



1. A video recording camera comprising:

image pick up means including a picture taking lens having at least one part;

recording means for recording a video signal obtained with the image pick up means on a recording medium;

a motor for producing motive power;

running means for running the recording medium with the motive power from the motor; and

selectively transmitting means for selectively transmitting the motive power from the motor to the lens and to the running means.

4,511,933

METHOD AND APPARATUS FOR RECORDING A DIGITAL INFORMATION SIGNAL

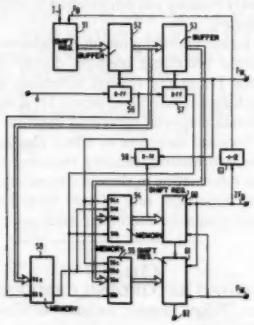
Martijn H. H. Höfelt; Edmond de Niet, and Albert M. A. Rijckaert, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 13, 1983, Ser. No. 457,780

Claims priority, application Netherlands, Sep. 20, 1982, 8203619

Int. Cl.³ G11B *5/09, 21/10*

U.S. Cl. 360—47 **12 Claims**



1. A method of recording a digital information signal into information tracks on a record carrier, in which at least one tracking signal, comprising a selected carrier wave of comparatively low frequency relative to that of information in said digital information signal, is used to provide information about the position, transverse to the track direction, of a read head relative to the information track to be scanned, characterized in that said method comprises the steps:

converting each of consecutive information words in said digital information signal into a first and a second channel words, wherein said first channel word forms part of a group of permissible channel words having a d.c. content unequal to zero and said second channel word is the complement of said first channel word;

generating a binary control signal from said tracking signals, wherein the binary control signal is dependent on the frequency of said tracking signal;

alternately selecting said first or second channel word under control of said binary control signal; and

recording said selected control word on said record carrier, whereby the tracking signal is encoded in the d.c. content of the channel words.

4,511,934

VIDEO TAPE RECORDER

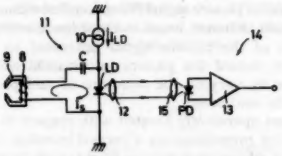
Takao Ohira, Fujisawa; Daijiro Okihara, Hadano, and Makoto Niiro, Sagamihara, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 9, 1982, Ser. No. 416,328

Claims priority, application Japan, Sep. 11, 1981, 56-144162

Int. Cl.³ G11B *5/00*

U.S. Cl. 360—55 **12 Claims**



1. A video tape recorder comprising: a rotary magnetic head drum having rotating means and a magnetic head mounted on said rotating means, said magnetic head including a coil and being adapted to record or reproduce video signal information on a magnetic tape; a laser element mounted on said rotating means; means for supplying a constant current to said laser element; means for electrically connecting said coil to said laser element, whereby said laser element is adapted to produce an optical output including optical video signals; stationary photoelectric conversion means means mounted in said video tape recorder; and optical transmission means for transmitting optical video signals between said laser element and said photoelectric conversion means.

4,511,935

TAPE RECORDER

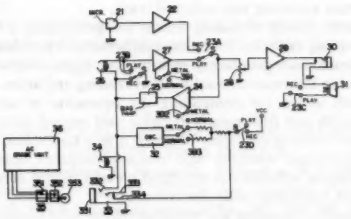
Yougo Imai, and Hideo Takenaga, both of Tokyo, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Nov. 18, 1982, Ser. No. 442,572

Claims priority, application Japan, Nov. 20, 1981, 56-186385

Int. Cl.³ G11B *5/47*

U.S. Cl. 360—66 **6 Claims**

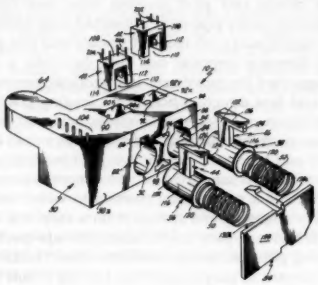


1. A tape recorder comprising a recording unit having recording bias oscillating means for supplying an AC recording bias current a recording head for receiving the bias current, and erase head, and erase means for supplying said erase head with DC erasing current during recording; and an AC erase unit which is connectable to said unit for supplying AC erasing current to said erase means instead of said DC erasing current so that said erase means supplies AC erasing current to said erase head, said AC erase unit being conductively coupled to said recording bias oscillatory means for receiving the AC bias current and using the AC bias current to produce the AC erasing current.

4,511,936
SWITCH AND OPTICAL SENSOR ASSEMBLY FOR RECORDER

Dewey M. Sims, Jr., Wayne, Mich., assignor to Northern Telecom Inc., Nashville, Tenn.

Filed May 24, 1982, Ser. No. 381,401
Int. Cl.[3] G11B *15/18*
U.S. Cl. 360—69 20 Claims



6. A switch assembly for a tape recorder having a housing adapted to receive a tape cartridge in an operating position, said tape cartridge including means for indicating whether said tape cartridge is write-protected, said switch assembly comprising:

a switch housing having a cartridge-facing wall and defining first and second chambers, said switch housing including a plurality of reference surfaces, all of said reference surfaces comprising accurately-located positioning means for engaging corresponding reference surfaces on said tape recorder housing, said switch housing being provided with manufacturing tolerances that complement the alignment tolerances of said tape cartridge;

a first switch mounted on and in fixed relationship to said switch housing;

a second switch mounted on and in fixed relationship to said switch housing;

first actuating means mounted for guided reciprocal movement within said first chamber and precisely located so as to be responsive to the position of said tape cartridge for actuating said first switch when said tape cartridge is in said operating position; and

second actuating means mounted for guided reciprocal movement within said second chamber and precisely located so as to be responsive to said indicating means, for actuating said second switch when said indicating means indicates that said tape cartridge is not write-protected.

4,511,937
INERTIAL TAPE POSITIONING METHOD AND APPARATUS

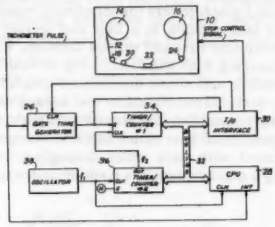
Manuel A. Guerrero, Ft. Lauderdale, Fla., assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 14, 1983, Ser. No. 475,338
Int. Cl.[3] G11B *15/22*
U.S. Cl. 360—72.1 21 Claims

17. A method of positioning a tape at a predetermined point, said tape being wound on at least one reel of a tape machine, comprising the steps of:

winding said tape in respect to said reel while moving the tape toward said predetermined point at a preset speed;

determining the inertia of said tape while said tape is winding; and

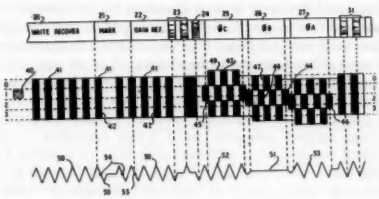


stopping said tape at said predetermined point in response to said determination of said inertia of the wound tape.

4,511,938
MAGNETIZABLE RECORDING DISK AND DISK FILE EMPLOYING SERVO SECTOR HEAD POSITIONING

Alan J. Betts, Romsey, England, assignor to International Business Machines, Armonk, N.Y.

Filed Jun. 15, 1983, Ser. No. 504,764
Claims priority, application European Pat. Off., Jun. 18, 1982, 82303180
Int. Cl.[3] G11B *5/58, 21/10, 23/34*
U.S. Cl. 360—77 11 Claims



1. A magnetizable recording disk divided into data sectors, each having a plurality of concentric tracks for the recording and reproducing of information by an associated magnetic transducing head, and having servo sectors, interspersed with the data sectors, containing position reference information defining the radial position of the data tracks for an associated head positioning servo system, the position reference information comprising a circumferentially extending and radially repeated magnetization pattern having at least two radially offset subsets of elements from each of which a different phase of radial position error signal, indicating displacement from a data track centre line, can be derived, the record member being characterised in that the position reference information pattern comprises at least three such subsets of elements, whose radial offset from each other is less than the pitch of the data tracks and whose individual elements each have a radial width greater than the pitch of a data track.

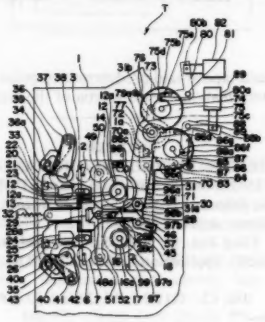
4,511,939
CASSETTE TAPE RECORDER

Isao Shinohara, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 14, 1982, Ser. No. 398,214
Claims priority, application Japan, Jul. 17, 1981, 56-112480; Jul. 17, 1981, 56-112481; Jul. 17, 1981, 56-112482
Int. Cl.[3] G11B *15/00*
U.S. Cl. 360—93 4 Claims

1. A cassette tape recorder for use with a magnetic tape cassette accommodating a magnetic tape therein and having

first and second tape pads, and first and second capstan holes located in opposite sides of said first and second tape pads, said cassette tape recorder comprising first and second capstans adapted to be inserted into said first and second capstan holes, first and second pinch rollers for selectively running the magnetic tape of said cassette in a first and second direction in association with said first and second capstans, a change-over means for changing over the functioning of said first and second pinch rollers, and a first and second magnetic head base plate having mounted therein a first and second magnetic head corresponding to said first and second tape pads, said first and second magnetic head base plates and said change-over means being associated with each other through a first actuating means having a pivotal point in a position approximately intermediate said first and second capstans for see-saw movement so that said first magnetic head is arranged to provide sufficient contact with said magnetic tape to achieve a reproducing state, with said second magnetic head located at an upstream position with respect to said first magnetic head being adapted to provide minimum, non-reproducing contact of the magnetic tape during the first running function of said magnetic tape, and said second magnetic head being arranged to provide sufficient contact with said magnetic tape to achieve a reproducing state, with said first magnetic head located at an upstream side with respect to said second magnetic head being adapted to provide a minimum, non-reproducing contact with the magnetic tape during the second running function of said magnetic tape.

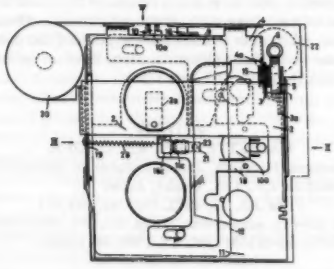


4,511,940

TAPE PLAYER HAVING MOTOR-DRIVEN TAPE-PACK LOADING MECHANISM

Katsumi Yamaguchi; Kazuki Takai, and Hitoshi Okada, all of Saitama, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1981, Ser. No. 308,756
Int. Cl.³ G11B *23/10, 5/54*
U.S. Cl. 360—96.6 **9 Claims**



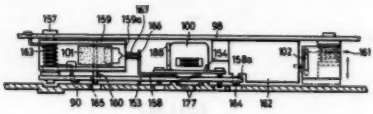
1. A magnetic tape recording/playing apparatus having a motor-driven tape-pack loading mechanism, comprising: a chassis; a push member supported on said chassis for reciprocal movement between first and second positions in directions substantially parallel to a first direction in which a tape-pack can be manually inserted into said apparatus, said push member having means engageable with a tape-pack manually inserted into said apparatus for limiting movement of the tape-pack in said first direction relative to said push member so that the tape-pack moves said push member from said first to said second position as the tape-pack is inserted; first resilient means yieldably urging said push member toward said first position in a second direction opposite said first direction; a tape-pack holder supported for movement in directions generally transverse of said first direction between a loading position and a playing position, said tape-pack holder being adapted to receive a tape-pack inserted into said apparatus in said first direction when said tape-pack holder is in said loading position; a magnetic tape head supported for movement between a playing position and a non-playing position in which said head is respectively engaging and spaced from a tape in a tape-pack disposed in said tape-pack holder when said tape-pack holder is in its playing position; second resilient means yieldably urging said head toward its playing position; locking means for releasably holding said head in its non-playing position; means for causing said locking means to release said head when said tape-pack holder has moved from its loading position into its playing position; a motor; first means driven by said motor and adapted to move said tape-pack holder from its loading to its playing position when said push member is in its second position, said first means including a rack provided on and extending approximately parallel to the direction of movement of said tape-pack holder, a gear which is rotatably supported on said push member and operatively engages said rack when said push member is in said second position, second means for drivingly coupling said motor to said gear when said push member is in said second position so that said motor effects rotation of said gear, and third means for interrupting said engagement between said gear and said rack when said tape-pack holder is in its playing position; and further locking means for releasably holding said push member in said second position, and wherein said third means causes said further locking means to release said push member when said tape-pack holder has reached said playing position.

4,511,941

CASSETTE TAPE APPARATUS WITH ADJUSTABLE HEAD POSITIONING CHARACTERISTICS

Mitsuru Ida, Koshigaya, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,670
Claims priority, application Japan, Dec. 29, 1980, 55-188031
Int. Cl.³ G11B *5/54, 15/00*
U.S. Cl. 360—105 **14 Claims**



1. A cassette tape apparatus comprising:

a chassis having mounting means fixed thereto and defining an opening and upwardly directed projections disposed on a surface of said mounting means;

a cassette holding means pivotally mounted on said chassis for angular movement relative to the latter between an inclined cassette receiving position and an operative position in which a cassette received in said holding means is loaded flat against said chassis;

means defining a pivot axis on said cassette holding means at

right angles to the axis of said angular movement relative to the chassis;

a magnetic head;

a head base carrying said head and mounted on said pivot axis for movement thereabout relative to said cassette holding means between a rest position and an active position to permit insertion and removal of a cassette into and from said holding means in said inclined cassette receiving position with said head base in said rest position and to extend said head substantially into a cassette loaded flat on said chassis for engagement with the tape therein upon movement of said head base to said active position with said holding means in said operative position; and

a head base actuating member disposed under said mounting means and having an operating arm projecting upwardly through said opening in said mounting means to engage said head base when said cassette holding means is moved to said operative position;

said upwardly directed projections being positioned on said surface of said mounting means to be slidably engaged by said head base approximately at the location of said head when said cassette holding means is in said operative position and said head base is moved between said rest and active positions.

4,511,942

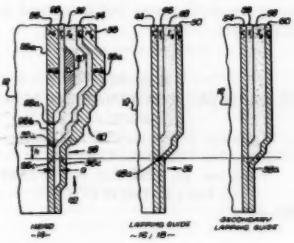
AUTOMATIC THROAT HEIGHT CONTROL FOR FILM HEADS

Erich P. Valstyn, Santa Barbara, Calif., assignor to Computer & Communications Technology Corp., Santa Barbara, Calif.

Filed May 7, 1982, Ser. No. 375,714

Int. Cl.³ G11B *5/16*

U.S. Cl. 360—126 **7 Claims**



1. In a thin film magnetic head module of the type having one or more head elements, each of which is formed of a pair of magnetic film pole pieces separated by a first insulating film at the tip of the head element and the first insulating film and one or more additional insulating films along a remaining portion of the head element, wherein the tip extends from an edge of the additional film to a pole face established by lapping, wherein the head module includes at least one lapping guide offset from the edge of the additional film to indicate when lapping of the tip should terminate, the improvement wherein the position of the lapping guide is determined by one or more films which are formed during the same processing steps as the additional insulating films of the head, thereby increasing the precision of the lapping of the head.

4,511,943

DAMAGE CONTROL APPARATUS FOR MAGNETIC TAPE TRANSPORT

Erno H. Fechner, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1982, Ser. No. 364,733

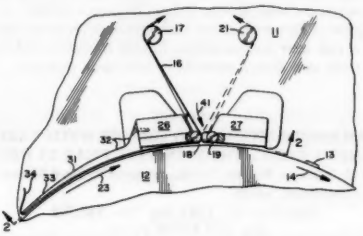
Int. Cl.³ G11B *15/60*

U.S. Cl. 360—130.23 **6 Claims**

1. Apparatus for smoothing out a kink in the free trailing end of a tape moving from an upstream tape path segment generally coincident with a rotating-head path of a magnetic tape scanning drum and toward a downstream tape path segment tangentially separating from the head path and approaching a first tape guide spaced from the drum, comprising:

means positioned alongside said tape path opposite said drum and upstream from the first guide, for encountering and smoothing out the approaching kink;

said smoothing out means being in the form of a thin blade presenting generally opposite major faces substantially concentric with said drum and defining therebetween an upstream blade edge portion and a downstream blade back portion; and



said blade having a thickness dimension in a radial direction of said drum that is substantially smaller than the corresponding dimension of said kink, so as to cause said kink, upon first encountering said blade edge portion, to go into a whiplash mode and to flap around said blade edge portion and downstream therefrom against the major face of said blade that is remote from said drum and to be straightened and smoothed out by the cooperative action of its own downsteam acceleration and momentum, and thereafter to be pulled back in an upstream direction and around said blade edge portion, and thence downstream between said blade and drum, as by the continuing downstream movement of the mass of tape downstream from said free end segment thereof.

4,511,944

MAGNETIC DISK CARTRIDGE

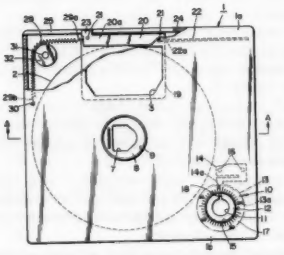
Etsuro Saito, Ayase, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 388,998

Claims priority, application Japan, Jun. 16, 1981, 56-88562[U]

Int. Cl.³ G11B *23/02, 5/012, 17/02;* **B65D** *85/30*

U.S. Cl. 360—133 **14 Claims**



1. In a magnetic disc cartridge having a jacket and a rotatable magnetic disc housed within said jacket for recording signals thereon and reproducing signals therefrom when said cartridge, carried between opposing guide rails of a cartridge holder, is inserted into recording or reproducing apparatus, the

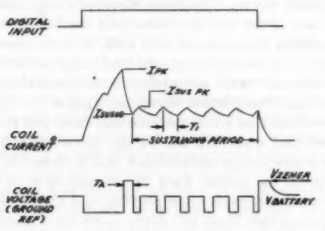
combination of: a guide groove in one wall of said jacket extending in the direction in which said cartridge is slid between said guide rails of said cartridge holder for receiving a guide element on one of said guide rails to establish a predetermined orientation of said cartridge relative to said cartridge holder when said cartridge is properly oriented relative to said guide rails, wherein said guide groove is open along a length thereof for permitting said guide element to extend transversely into said guide groove during sliding of said cartridge between said guide rails; a window in said jacket for providing access to said magnetic disc to record signals thereon and reproduce signals therefrom; shutter means movable relative to said window between a closed position covering said window and an open position exposing said magnetic disc; and engagement means on said shutter means disposed relative to said guide groove for contact by said guide element as said cartridge is slid into said cartridge holder to move said shutter means from said closed position to said open position.

4,511,945

SOLENOID SWITCHING DRIVER WITH FAST CURRENT DECAY FROM INITIAL PEAK CURRENT

Arnold D. Nielsen, Wayne, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1983, Ser. No. 565,796
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—154 **11 Claims**



1. A solenoid driver circuit for controlling application of current to a solenoid and reducing the total power dissipation during activation of the solenoid, said solenoid driver circuit including:

a first and a second transistor means coupled to the solenoid;

a sense resistor coupled in said solenoid driver circuit to sense current flowing in the solenoid;

a Zener diode coupled in series with said sense resistor and the solenoid so as to provide a current decay path in series with said sense resistor thereby providing an indication of solenoid current by the voltage drop across said sense resistor;

a first comparator means coupled to said sense resistor to compare the sensed current of the solenoid to a first control current representative of a desired initial peak current in the solenoid;

a second comparator means coupled to said sense resistor to compare the sensed current of the solenoid to a second control current representative of a desired low sustaining current in the solenoid;

a third comparator means coupled to said sense resistor to compare the sensed current of the solenoid to a third control current representative of a desired sustaining peak current in the solenoid;

logic means coupled to said first, second and third comparator means and said first and second transistor means so as to receive input signals which are a function of the solenoid current and the first, second and third control currents, for switching said first and second transistor means on and off as a function of the output of said first, second and third comparator means so that an initial peak current level is applied to the solenoid, there is a relatively rapid current decay to a predetermined low sustaining current level, another increase in driving current to the solenoid to a sustaining peak current level, said sustaining peak current level being less in magnitude than said initial peak current magnitude; and

said logic means including:

a timer means for establishing a predetermined current decay time from the sustaining peak current level so that after an increase in solenoid driving current to the sustaining peak current magnitude there occurs a subsequent slower current decay, relative to said rapid current decay, for a predetermined time period;

a first flip-flop means coupled to said first comparator means for generating a logic state;

a second flip-flop means coupled to said second comparator means for generating a logic state;

a first OR gate means coupled to said second comparator;

a second OR gate coupled to said third comparator and said third flip-flop means;

a first AND gate coupled to said second flip-flop means;

a second AND gate means coupled to said second OR gate means and adapted to receive a digital input;

a fourth flip-flop means coupled to said first and second AND gate means for generating a logic signal;

a first timer means coupled to said fourth flip-flop means and said first AND gate for timing the length of said predetermined current decay period;

a third OR gate means coupled to said first and fourth flip-flop means;

a third AND gate coupled to said third OR gate and to the digital input;

said first transistor means being coupled to said third AND gate means; and

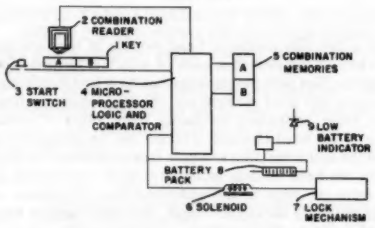
said second transistor means being coupled to said second flip-flop means.

4,511,946

PROGRAMMABLE COMBINATION ELECTRONIC LOCK

Wallace A. McGahan, Lawrenceville, N.J., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Jan. 14, 1983, Ser. No. 457,965
Int. Cl.³ H01H *47/28*
U.S. Cl. 361—172 **8 Claims**



1. A method for combining electronic locks by sequential users comprising the steps of:

providing a key with a first and second combination;

providing a lock with a first and second stored combination;

reading said first and second combinations on said key and comparing said first key combination with said first lock combination and said second key combination with said second lock combination; and

opening said lock in a first mode of operation by a former repeat user in response to said first key combination equaling said first lock combination and said second key combination equaling said second lock combination; and

in a second mode of operation by a new user, comparing said

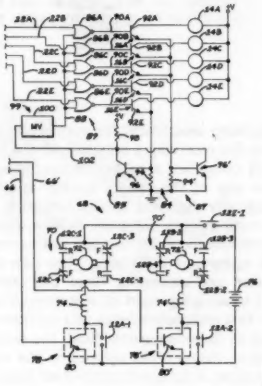
first key combination with said second lock combination and recombinating said first and second lock combination respectively to said first and second key combination if said first key combination equals said second lock combination and opening the lock.

4,511,947

COIL AND COIL DRIVER CONTROL APPARATUS

Grant C. Melocik, Chardon, and William Pickering, University Heights, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Jan. 5, 1983, Ser. No. 455,778
Int. Cl.³ H01H *47/00*
U.S. Cl. 361—191 **10 Claims**



1. In an apparatus (10) having a plurality of controllable contactors, each contactor having an associated coil (14A–E) and coil driver (16A–E), and means (18) for selectively supplying respective control signals to controllably energize and deenergize each of said coil drivers (16A–E), the improvement comprising:

monitoring means (84) for sensing the total current flowing through said plurality of coils (14A–E) and supplying a variable current signal in response to the magnitude of said sensed total current; and

control means (85) for receiving said current signal and controllably limiting the number of concurrently energized coils (14A–E) to a preselected maximum number in response to the magnitude of said current signal.

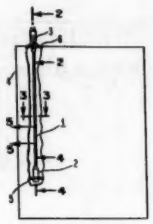
4,511,948

TWO LAYER PROBE

Frederick L. Maltby, Jenkintown; Kenneth M. Loewenstern, Warminster, and Jack G. Benning, Jr., Lansdale, all of Pa., assignors to Drexelbrook Controls, Inc., Horsham, Pa.

Continuation of Ser. No. 323,317, Nov. 20, 1981, Pat. No. 4,428,026, which is a continuation of Ser. No. 072,833, Sep. 6, 1979, Pat. No. 4,301,681. This application Jan. 20, 1984, Ser. No. 572,691
Int. Cl.³ G01F *23/26;* H01G *7/00*
U.S. Cl. 361—280 **10 Claims**

1. A probe assembly for the measurement of the level of conductive materials within a vessel having conductive wall portions comprising a probe member, an upper termination and a lower termination, said probe member comprising a conductive core covered by an insulating layer which is in turn covered by an outer layer, the outer layer being sufficiently conductive to become a substantially equipotential surface with respect to said core only in regions where it is surrounded by conductive material, said conductive core being in use electrically insulated from said conductive material, said upper termination including means for attachment to said outer layer so as to provide physical support of said probe member while maintaining electrical isolation of said core and said outer layer from said vessel and also including means for electrical connection to said core, and said lower termination maintaining electrical isolation of said core and said outer layer from said vessel.

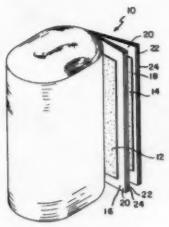


4,511,949

AROMATIC DIELECTRIC FLUID FOR A CAPACITOR

Vandos Shedigian, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Dec. 19, 1983, Ser. No. 562,392
Int. Cl.³ H01G *4/22*
U.S. Cl. 361—319 **4 Claims**



1. In a capacitor having dielectric means for separating electrodes that includes a polypropylene film, a dielectric fluid consisting essentially of about 100% by volume of an alkylated biphenyl for enhancing swelling in said film of from about 5% to about 15% by volume dependent on temperature, an epoxide for the cleaning up of thermal, chemical, and electrical decomposition within the capacitor, and an antioxidant of butylated hydroxytoluene.

4,511,950

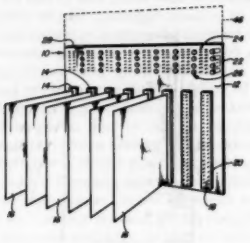
BACKPANEL ASSEMBLIES

Charles B. D. Bunner, Carp, and David S. Brombal, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 27, 1983, Ser. No. 507,734
Int. Cl.³ H05K *1/14*
U.S. Cl. 361—413 **10 Claims**

1. A backpanel assembly comprising a main backpanel having a plurality of elongate printed circuit board (PCB) connectors aligned in parallel thereon, the backpanel having a part extending beyond an end of the PCB connectors, the assembly including a plurality of power supply studs and a plurality of power supply pins, in respect of each of the PCB connectors, on said extending part of the backpanel, and printed circuit wiring interconnecting each power supply stud with at least

one power supply pin and with the associated PCB connector, whereby power can be supplied to printed circuit boards,



inserted into the PCB connectors, selectively via the associated power supply studs or via the associated power supply pins.

4,511,951

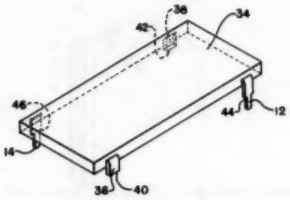
MULTILAYER DECOUPLING CAPACITOR AND METHOD OF MANUFACTURE THEREOF

Michael M. Gottlieb, Kraainem, Belgium, assignor to Rogers Corporation, Rogers, Conn.

Filed Nov. 14, 1983, Ser. No. 551,576

Int. Cl.³ H01G *9/00, 7/00*

U.S. Cl. 361—433 **24 Claims**



17. A decoupling capacitor including:

a first electrically conductive connection plate;

a second electrically conductive connection plate;

a first electrically active terminal pin extending from said first connection plate;

a second electrically active terminal pin extending from said second connection plate;

said first and second electrically active terminal pins being at different positions relative to the decoupling capacitor;

a multilayer capacitive element between said first and second connection plates, said capacitive element having first and second electrically conductive end surfaces;

a layer of electrically insulating material;

said first and second connection plates and said capacitive element being bonded to said layer of insulating material on one side of said layer of insulating material with said first connection plate and said first conductive end surface being electrically connected and said second connection plate and said second conductive end surface being electrically connected;

a molded encapsulating cover encapsulating said connection plates and capacitive element, with said electrically active terminal pins extending from said encapsulating cover at a first pair of positions; and

a pair of electrically inactive stabilizing elements, said stabilizing elements being at a second pair of positions to balance said terminal pins.

4,511,952

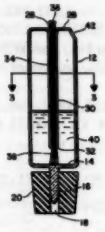
FLUID LAMP ASSEMBLY

Willy Vanbragt, 544 Weddell #7, Sunnyvale, Calif. 94086

Filed Jul. 13, 1983, Ser. No. 513,470

Int. Cl.³ F21V *19/00*

U.S. Cl. 362—181 **6 Claims**



1. A fluid lamp attachment for converting a candle holder having a cup for receiving a bottom end of a candle to a fluid lamp, which comprises a rubber stopper dimensioned to be held by the cup of the candle holder, said rubber stopper having a centrally disposed, axially extending opening, and a fluid lamp comprising a one piece hollow glass container for holding a combustible fluid, said one piece container having a top with an opening, a cylindrical glass tube forming part of said container and extending from the container opening toward, and terminating short of, a bottom of said container, a wick with a first end positioned in said cylindrical glass tube to be immersed in the combustible fluid, the second end of said wick extending through the opening in the top of said container for ignition of the combustible fluid drawn to the second end of said wick by capillary action, the bottom of said container having a projecting tip dimensioned and configured to be held in the opening of said rubber stopper, said one piece container having a port spaced from said cylindrical glass tube for inserting the combustible fluid into said container.

4,511,953

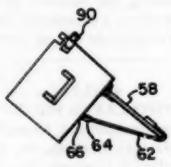
THEATRICAL LIGHT BOX

Bonnard Fage, 100 Wompatuck St., Hingham, Mass. 02043

Filed Sep. 17, 1984, Ser. No. 650,894

Int. Cl.³ F21V *9/00*

U.S. Cl. 362—230 **12 Claims**



1. A light box comprising a box-like base member and a cover, the base member having a base, first wall, a second wall, a top wall and a bottom wall, the first wall, second wall, top wall and bottom wall extending from the base **16** with the first wall in spaced parallel relation to the second wall and the top wall and the bottom wall in spaced parallel relation to each other and in right angle relation to the first and second walls; the base, first wall, second wall, top wall and bottom wall defining a primary compartment; the bottom wall having a first free edge and the first wall, second wall and top wall having free edges, the free edges of the first wall, second wall, top wall and the first free edge of the bottom wall lying on the same horizontal plane defining an opening, the cover having an inner surface, an outer surface, a first side edge and a second side edge, the first side edge of the cover pivotally engaged to

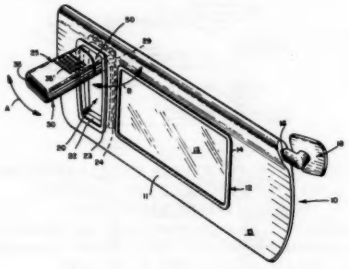
the first free edge, the second side edge having an adjustable connector extending therefrom and engageable with the base member, the primary compartment having an electric light mounted therein whereby the base member may be positioned on a flat surface resting on the second side edge and the edge defined by the juncture of the base and the bottom wall.

4,511,954

VISOR WITH AUXILIARY LIGHT

Konrad H. Marcus, and Michael J. Cody, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Filed Dec. 13, 1982, Ser. No. 448,940
Int. Cl.³ F21V *21/28, 33/00;* B60Q *3/02*
U.S. Cl. 362—275 **7 Claims**



2. Auxiliary lighting means for a vehicle visor having first and second spaced surfaces and peripheral edges defining the outline of said surfaces; a recess in said surfaces comprising:

a light assembly including a relatively flat housing adapted to be positioned in said recess flush with said surfaces and means located between said surfaces for pivotally mounting said assembly to said vehicle visor for movement about a first axis between a stored position within said recess in said visor to a use position pivoted outwardly from said recess; and

a coupling between said light assembly and said means for pivotally mounting said light assembly to permit movement of said light assembly about a second axis generally orthogonal to said first axis.

4,511,955

VEHICLE HEADLIGHT

Hans-Otto Ernst, and Wilhelm Röhling, both of Lippstadt, Fed. Rep. of Germany, assignors to Westfälische Metall Industrie KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

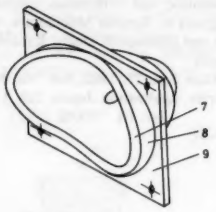
Filed May 16, 1983, Ser. No. 494,761
Claims priority, application Fed. Rep. of Germany, May 18, 1982, 3218702
Int. Cl.³ F21M *3/08*
U.S. Cl. 362—347 **18 Claims**

1. A vehicle headlight for providing a shaped beam comprising a dish-shaped reflector having an axis

where an inner reflection surface in a section containing the axis of the reflector in each case forms an ellipse segment;

where the ellipse eccentricity increases from the longitudinal section spanned by the vertical and the reflector axis to the longitudinal section spanned by the horizontal and the reflector axis;

where the focal points of the ellipse segments of all sections disposed in planes containing the reflector axis coincide; and



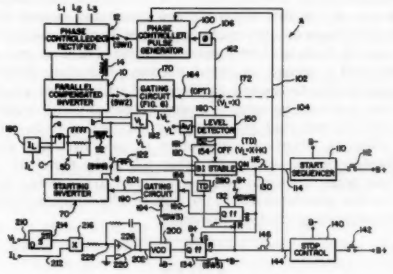
where the vertices of the ellipse segments of all sections disposed in planes containing the ellipse axis coincide.

4,511,956

POWER INVERTER USING SEPARATE STARTING INVERTER

Shashi B. Dewan, Toronto, Canada, and Graham R. Adams, Boaz, Ala., assignors to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed Nov. 30, 1981, Ser. No. 325,750
Int. Cl.³ H02P *1/04, 13/20*
U.S. Cl. 363—49 **41 Claims**

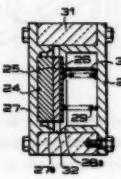


1. In a power inverter for converting a D.C. current into alternating current having a frequency controlled by the rate at which a series of gating signals are created, said inverter including control means for selectively energizing said power inverter, a first branch to be connected across a load, a second branch to be connected across said load, first switching means for applying a voltage of a first polarity across said load by said first branch, second switching means for applying a voltage of a second polarity across said load by said second branch and means for alternately operating said first and second switching means by said series of gating signals, the improvement comprising: a separated starting inverter having a D.C. input and a A.C. output with a frequency controlled by a series of repeating gating commands, means for selectively applying said A.C. output across said load until a preselected load condition exists, means for disconnecting said A.C. output of said starting inverter from said load in predetermined timed relationship with energizing said power inverter and wherein said energizing means include means to increase the power to said power inverter.

4,511,957
POWER CONVERTER

Susumu Matsumura, and Mitsumasa Imataki, both of Hyogo, Japan, assignors to Susumu Matsumura, Hyogo and Susumu Matsumura and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jun. 27, 1983, Ser. No. 508,290
Claims priority, application Japan, Jul. 12, 1982, 57-120844
Int. Cl.³ H02H *7/125*
U.S. Cl. 363—54 **4 Claims**



1. A power converter having a plurality of thyristor elements connected in series with one another and overvoltage limiters each connected between the anode and the cathode of the associated thyristor elements individually, each of said overvoltage limiters comprising an overvoltage limiting element connected between the anode and the cathode of said thyristor element, and means for short-circuiting the ends of said overvoltage limiting element in response to a load current flowing in said overvoltage limiting element, each of said overvoltage limiters comprising a first electrode kept in contact with one end face of said overvoltage limiting element, a metal layer of a low melting point disposed opposite to said first electrode and kept in contact with the other end face of said overvoltage limiting element, a second electrode disposed opposite to said first electrode and connected electrically to said metal layer of a low melting point, a first extended portion protruding from said first electrode toward said second electrode, and a second extended portion protruding from said second electrode toward the fore end of said first extended portion and forming a gap of a predetermined width in relation to said fore end, said gap being so positioned as to be suitable for effecting electrical connection of said first and second extended portions with each other when the metal of a low melting point flows into said gap posterior to becoming molten by the heat generated due to the flow of a load current through said overvoltage limiting element.

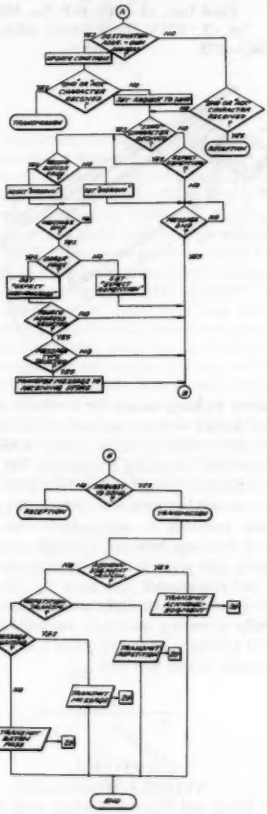
4,511,958
COMMON BUS ACCESS SYSTEM USING PLURAL CONFIGURATION TABLES FOR FAILURE TOLERANT TOKEN PASSING AMONG PROCESSORS

Gerhard Funk, Ennetbaden, Switzerland, assignor to Patelhold Patentverwertungs- & Elektro-Holding AG, Glarus, Switzerland

Continuation-in-part of Ser. No. 194,000, Oct. 6, 1980, abandoned, which is a continuation of Ser. No. 6,907, Jan. 26, 1979, abandoned. This application Oct. 26, 1981, Ser. No. 314,733
Claims priority, application Switzerland, Jan. 30, 1978, 984/78
Int. Cl.³ G06F *3/04, 15/16*
U.S. Cl. 364—200 **23 Claims**

19. A data exchange method for a system having a plurality of data processing partners, a data bus for interconnecting said data processing partners, said data processing partners communicating with each other via said data bus, individual channel equipment circuits associated with each respective one of said data processing partners, said channel equipment circuits operating in conjunction with said respective data processing partner to guarantee that only one of said partners is allowed to transmit over said data bus at any given time, said system further being of the type which does not employ a central controller and which is designed to continue its data exchange even after the failures of several of said plurality of data processing partners, said method comprising the steps of:

(A) sequentially transferring access from a partner who has access to said data bus to a next partner by generating an access-passing-on message and transmitting said access-passing-on message over said data bus, said access-passing-on message including a source address block identifying the address of said partner who has access to said bus and a destination address identifying the address of said next partner, said next partner being selected from an actual configuration table maintained by each of said partners;



(B) generating data information messages and transmitting each of said data information messages over said data bus whenever said partner who has access to said data bus has data information available for transmission, said data information message including an address block identifying the address of said partner who has access to said data bus, a destination address identifying the address of said next partner, and information type block identifying the type of information being transmitted and at least one data information block containing the data being transmitted, each of said data information blocks being the same length;

(C) determining at each one of said partners whether said partner is to process a received data information message;

(D) generating at each partner which has received a data

information message which was free of errors, an acknowledgment message and sequentially transmitting said acknowledge message on said data bus, each said partner generating said acknowledgement message in a predetermined sequence with respect to the remaining partners;

(E) maintaining at each partner a nominal configuration table which includes the addresses of all of said partners and said actual configuration table which includes the addresses of all partners which are active participants in said data exchange system, said partners which are active participants periodically offering access to said data bus means to partners whose addresses are not included in said actual configuration table; and

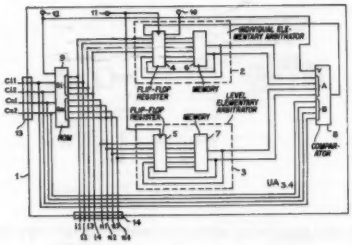
(F) allowing said partner who has access to said data bus to transfer access to another partner which is listed in said actual configuration table immediately after said next partner in the event that said next partner fails to acknowledge said acknowledgment message.

4,511,959

DECENTRALIZED ARBITRATION DEVICE FOR SEVERAL PROCESSING UNITS OF A MULTIPROCESSOR SYSTEM

Alain Nicolas, and Jean Chapelain, both of Colombes, France, assignors to Thomson-CSF - Telephone, Colombes, France

Filed Nov. 4, 1981, Ser. No. 318,136
Claims priority, application France, Nov. 7, 1980, 80 23877
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **4 Claims**



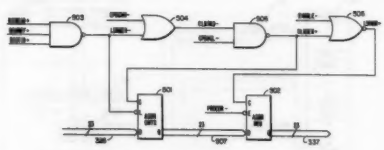
1. A decentralized arbitration device for several processing units of a multiprocessor system comprising p.n processing units all connected to a common bus and divided into p groups each comprising n processing units each associated with an arbitration unit, wherein each arbitration unit comprises an elementary arbitrator for individual priority determination and an elementary arbitrator for group priority determination, the inputs of the individual priority elementary arbitrators being connected, in each group, to the corresponding conductors of an individual request connection particular to the group considered, the inputs of the elementary arbitrators for group priority determination of all the arbitration units being connected to the corresponding conductors of a common group priority request connection, the inputs of the two elementary arbitrators of each arbitration unit being also connected to the output of a priority request signaling device of the corresponding processing unit whereby said arbitration device has a priority attribution cycle wherein each unit having a priority request is allowed to perform a single elementary operation in each cycle.

4,511,960

DATA PROCESSING SYSTEM AUTO ADDRESS DEVELOPMENT LOGIC FOR MULTIWORD FETCH

Daniel A. Boudreau, Billerica, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 15, 1982, Ser. No. 339,549
Int. Cl.³ G06F *9/10, 9/32, 13/00*
U.S. Cl. 364—200 **1 Claim**



1. In a software analyzer connected to a common bus of a data processing system in which a central processor unit (CPU) makes requests for multiple words of information to be transferred between a memory and said CPU and in which said multiple words of information are transferred one word at a time over said common bus during multiple information transfer cycles, an improved address development logic for developing consecutive addresses to be associated with said multiple words, wherein the improvement comprises:

A. a synchronous presettable address counter, coupled to said common bus, said address counter having data input for receiving a starting address and data outputs for providing a next address;

B. an address register, coupled to said address counter, said address register having data inputs for receiving said next address and data outputs for providing a current address;

C. a load means, coupled to said address counter and said common bus, said load means for providing a signal to enable the loading of said address counter with said starting address when said loading means detects the transfer of said starting address during an initial information transfer cycle of said multiple information transfer cycles;

D. an early cycle clocking means, coupled to said address counter and said common bus, said early cycle clocking means for providing a signal to said address counter incidating that it is early in an information transfer cycle of said multiple information transfer cycles and that said address counter if load enabled should load said starting address, or if not load enabled said address counter is to compute said next address; and

E. a late cycle clocking means, coupled to said early cycle clocking means and said address register, said late cycle clocking means for providing a signal indicating to said address register that it is to load said next address into said address register, said late cycle means producing said clocking signal late in said information transer cycle, whereby during all but said initial transfer cycle in which said starting address is transferred, said address counter is computing the next address while said current address remains available at the outputs of said address register.

4,511,961

APPARATUS FOR MEASURING PROGRAM EXECUTION

Perry W. Penton, Columbia, S.C., assignor to NCR Corporation, Dayton, Ohio

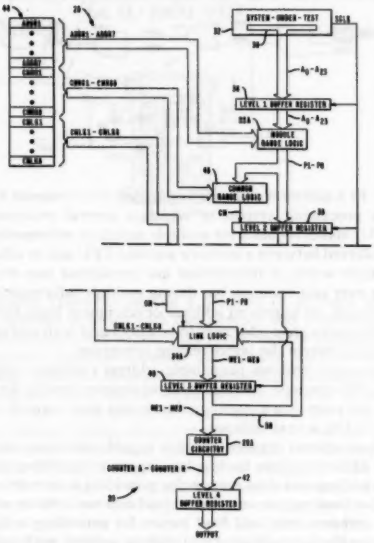
Filed Apr. 16, 1982, Ser. No. 369,057
Int. Cl.³ G06F *11/28, 9/06*
U.S. Cl. 364—200 **14 Claims**

1. An apparatus for measuring the execution of instructions, each of the instructions stored in a memory at a memory location having a memory address associated therewith, the memory being accessed by a memory bus for carrying memory addresses thereon, said apparatus comprising:

range detection means connected to said memory bus and

responsive to the memory addresses thereon for detecting memory addresses within a first range and memory addresses within a second range;

counter means enabled in response to said range detection means for incrementing said counter means at least once for each presence on said memory bus of a memory address within said first range; and

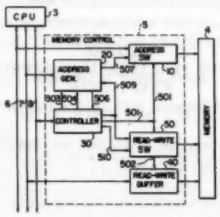


link logic means connected to said range detection means and said counter means for enabling said counter means to also be incremented at least once for each presence of a memory address within said second range when an address within said second range is on said memory bus immediately following an address within said first range.

4,511,962
MEMORY CONTROL UNIT

Tetsuo Machida, Machida; Susumu Tsuhara, Sagamihara; Kuniaki Tabata, Tokyo, and Yasuyuki Okada, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,644
Claims priority, application Japan, Jul. 1, 1981, 56-101238
Int. Cl.[3] G06F *13/06, 7/00*
U.S. Cl. 364—200 **13 Claims**



1. A memory control unit connected between a memory for storing image data and a processor, comprising:

(a) address generator means for alternately supplying a read address signal for data to be read out from said memory and a write address signal for data to be written into said memory in each of a plurality of successive operating cycles, including means for altering said read and write addresses by predetermined amounts in each operating cycle;

(b) controller means for generating a first mode signal and a second mode signal;

(c) address switch means connected to said processor, said address generator means and said controller means for supplying an address signal from said processor to said memory in response to said first mode signal and for supplying the address signals from said address generator means to said memory in response to said second mode signal;

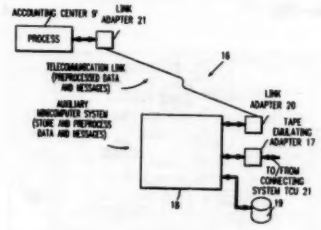
(d) a buffer memory connected to said memory; and

(e) read/write control means responsive to said second mode signal for alternately and repeatedly reading out data from a first area of said memory specified by said read address signal and storing the data so read in said buffer memory and writing data stored in said buffer memory into a second area of said memory specified by said write address signal.

4,511,963
EMULATION OF SPECIAL PURPOSE MAGNETIC TAPE DATA RECORDING EQUIPMENT BY A GENERAL PURPOSE PROCESSOR

Robert F. Kantner, Delray Beach, Fla., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 30, 1982, Ser. No. 412,669
Int. Cl.[3] G06F *3/04*
U.S. Cl. 364—200 **10 Claims**



1. In a data processing system in which signals representing information records are normally transferred from a primary processing system to magnetic tape storage equipment and corresponding signals are echoed from the tape equipment after a predetermined echo delay, the signals of each such record consisting of a varied length sequence of data byte signals timed at a first rate followed by a fixed length sequence of check byte signals timed at a second rate different from said first rate, said signals being stored by said equipment on magnetic tape media subject to manual handling, a method for replacing said tape equipment with a general purpose auxiliary processing system performing all of the functions of said tape equipment and presenting an interface to said primary system, for signal reception and echoing, which is identical to the interface presented by said tape equipment, but providing processing functions not available in said tape equipment and eliminating said manual handling of tape media, said method comprising performing the following operations in said auxiliary system:

receiving said record signals from said primary system;

storing information corresponding to said received signals byte sequentially in a buffer store having a limited capacity associated with said echo delay;

retrieving said information byte sequentially from said buffer

store, in the order of byte entry into said store, after time intervals corresponding to said echo delay;

transmitting echo signals to said primary system corresponding to said retrieved bytes;

determining when information being retrieved from said store respectively represents data bytes and check bytes; and

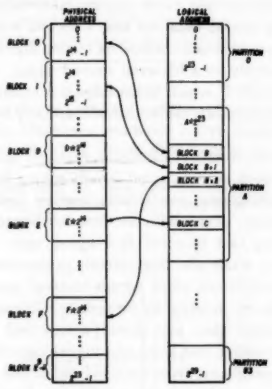
responsive to said determination, selectively timing the echo signals corresponding to said data bytes at a rate corresponding to said first rate and the echo signals corresponding to said check bytes at a rate corresponding to said second rate.

4,511,964

DYNAMIC PHYSICAL MEMORY MAPPING AND MANAGEMENT OF INDEPENDENT PROGRAMMING ENVIRONMENTS

Dennis D. Georg, and Benjamin D. Osecky, both of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 12, 1982, Ser. No. 440,895
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—200 **18 Claims**



1. A method of dynamically allocating to at least one data structure physical memory locations, each of which is accessible by a uniquely associated physical address, the set of all physical addresses associated with the physical memory locations being referred to herein as the physical address space, said method comprising the steps of:

assigning to each word of a data structure a unique logical address, each of said logical addresses being contained within a set of logical addresses referred to herein as the logical address space;

one-to-one mapping a set of physical addresses onto the set of logical addresses which have been assigned to a word of a data structure, whereby contiguous addresses within one of these address spaces are not necessarily associated by this map with contiguous addresses in the other address space; and

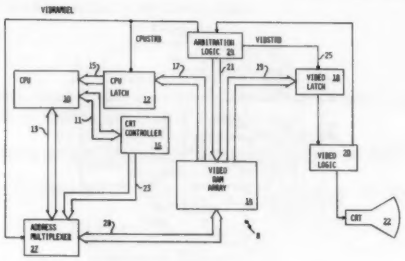
storing each word of the data structure in the physical memory location whose physical address was mapped onto the logical address assigned to that word.

4,511,965

VIDEO RAM ACCESSING SYSTEM

Babu Rajaram, St. Joseph, Mich., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Mar. 21, 1983, Ser. No. 446,296
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—200 **8 Claims**



1. In a data processing system including a central processing unit, video memory means characterized as having first and second modes of operation and including a plurality of addressable memory locations for storing central processing unit instructions, display instructions, and display graphics information, a raster scanned display unit for presenting said display graphics information thereon in accordance with said display instructions, and a controller unit responsive to said display instructions and said display graphics information for generating video drive signals for said display unit in presenting said display graphics information in accordance with said display instructions, wherein said video memory means is successively accessed by said central processing unit during a control cycle by means of a first data bus and a central processing unit latch during a central processing unit control cycle in response to an access request signal for writing said central processing unit instructions therein and reading said display instructions and display graphics information therefrom in said first mode of operation and is accessed by said controller unit by means of a second data bus and a video latch during a video processing cycle for reading said display instructions and display graphics information therefrom in driving said display unit in accordance therewith in said second mode of operation, a system for controlling the access of said video memory means by said central processing unit and said controller unit comprising:

first means responsive to the first mode of operation of said video memory means and further responsive to said access request signal for generating a first control signal in response thereto;

timing means responsive to the start of a video processing cycle for generating a second control signal equal in duration to two video processing cycles;

logic means coupled to said video memory means and to said video latch, and further coupled to said first means and to said timing means and responsive to said first and second control signals respectively output therefrom for generating a video strobe signal and a memory access signal, wherein said memory access signal is provided to said video memory means for initiating a video processing cycle and said video strobe signal is provided to said video latch for coupling said controller to said video memory means for two successive video processing cycles; and

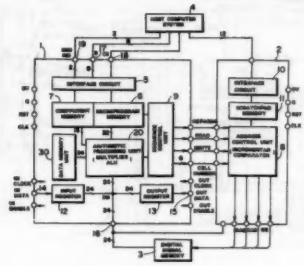
conducting means coupling said first means to said central processing unit latch for providing said first control signal thereto in initiating a control cycle wherein said central processing unit accesses said video memory means following said two successive video processing cycles.

4,511,966

DIGITAL SIGNAL PROCESSING SYSTEM

Osamu Hamada, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 28, 1983, Ser. No. 462,049
Claims priority, application Japan, Feb. 19, 1982, 57-25616
Int. Cl.[3] G06F *15/16*
U.S. Cl. 364—200 3 Claims



1. A digital signal processing system comprising

microprogram memory means for storing a plurality of microinstructions for instructing a digital signal processing procedure,

coefficient memory means for storing coefficient data required for performing a series of arithmetic operations on digital signal data,

a host computer system,

means for writing data into said microprogram memory means and said coefficient memory means from said host computer system,

said coefficient memory means having at least two selectable pages corresponding to a total memory area accessible during digital signal processing in accordance with said microinstructions, and

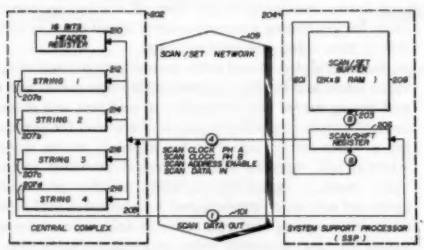
said host computer system controlling page selection of said pages of said coefficient memory means.

4,511,967

SIMULTANEOUS LOAD AND VERIFY OF A DEVICE CONTROL STORE FROM A SUPPORT PROCESSOR VIA A SCAN LOOP

Jerome J. Witalka, Minneapolis; Howard L. Buettner, Bloomington, and James G. Ellsworth, St. Paul, all of Minn., assignors to Sperry Corporation, New Yor, N.Y.

Filed Feb. 15, 1983, Ser. No. 466,761
Int. Cl.[3] G06F *1/00*
U.S. Cl. 364—200 25 Claims



1. Wherein a scan/settable register is defined as composite shift register, called a STRING, controllable by clock signals upon a scan/set network to bit-serially be set, meaning written, by data input signals and to bit-serially be scanned, meaning read, to produce data output signals, an improved method of bit-serially sequentially communicating data, called scan data, to and from such a scan/settable register within a slave first digital logic device, called a CENTRAL COMPLEX, from and to a controlling second digital logic device, called a SYSTEM SUPPORT PROCESSOR, to the end that bit-serial communication to, and bit-serial communication from, said scan/settable register should substantially transpire overlapped in simultaneous time, said method of concurrently writing and reading a scan/settable register comprising:

producing in said controlling second digital logic device clock signals, called SCAN CLOCK PH A and SCAN CLOCK PH B, sufficient in time and phase relationship to control the bit-serial shifting of the entirety of said scan/settable register, said STRING, within said slave first digital logic device, and transmitting said produced clock signals upon said scan/set network; while also concurrently in simultaneous time

responsively to said clock signals, bit-serially successively shifting first data bits stored within a first register, called a SCAN/SHIFT REGISTER, within said controlling second digital logic device successively serially out from a first end of said first register as a bit-serial first signal, called SCAN DATA IN, which said bit-serial first signal is transmitted upon a line of said scan/set network uniquely dedicated to said first signal; while also concurrently in simultaneous time

responsively to said clock signals, bit-serially successively shifting second data bits into a second end of said first register within said controlling second digital logic device responsively to a bit-serial second signal, called SCAN DATA OUT, which second signal is received upon said scan/set network; while also concurrently in simultaneous time

responsively to said clock signals received upon said scan/set network, writing by bit-serially setting from a first end and shifting said scan/settable register within said slave digital logic device with said first data bits responsively to receiving said bit-serial first signal upon said scan/set network; while also concurrently in simultaneous time

responsively to said clodk signals received upon said scan/set network, reading by bit-serially successively shifting said second data bits stored within said scan/settable register within said slave first digital logic device successively serially out from a second end of said scan/settable register as said bit-serial second signal, which said bit-serial second signal is transmitted upon a line of said scan/set network uniquely dedicated to said second signal;

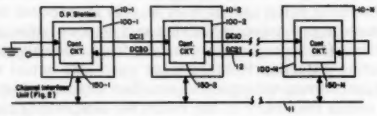
whereby said bit-serial signal transmissions upon unique signal lines upon said scan/set network is of said first signal, said SCAN DATA IN signal, from said controlling second digital logic device to said slave first digital logic device, and of said second signal, said SCAN DATA OUT, from said slave first digital logic device to said controlling second digital logic device, which transmissions signals and transmissions signal lines are thusly circular between said controlling second digital logic device and said slave first digital logic device, which circular communication upon said scan/set network is called a SCAN LOOP;

whereby both said bit-serial writing of first data bits into said scan/settable register and said reading of second data bits from said scan/settable register does transpire concurrently in simultaneous time.

4,511,968
COMMUNICATION CHANNEL INTERFACE UNIT

Gabor Fencsik, Berkley, and Fletcher M. Glenn, II, Danville, both of Calif., assignors to MDS-Qantel, Inc., Hayward, Calif.

Filed Mar. 24, 1983, Ser. No. 478,921
Int. Cl.[3] G06F *3/00*
U.S. Cl. 364—200 4 Claims



1. In a system having a plurality of data processing stations in which messages are exchanged among the stations over a communication channel and in which each station includes a processor to handle such message exchanges by asserting a request to send signal when it is desired to transmit a message and to provide such message for transmission upon the assertion of a clear to send signal, an improved channel interface unit for operating upon the request to send signal, posting the assertion of the clear to request signal and translating such message to the channel comprising:

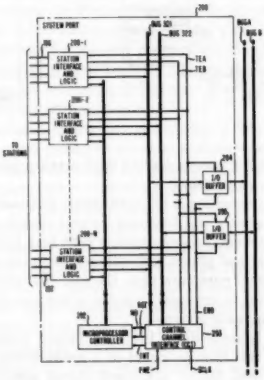
a channel contention circuit for asserting contention for use of the channel and for providing a set of contention status signals; and

a microstate machine arranged under program control to interact with the request to send signal and the channel contention status signals to enable the contention circuit to assert contention, to post such clear to send signal and to translate such message to the channel.

4,511,969
CONTROL CHANNEL INTERFACE CIRCUIT

Mark J. Koenig, Middlesex, and Kevin J. Oye, Holmdel, both of N.J., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed May 20, 1983, Ser. No. 496,483
Int. Cl.[3] G06F *15/16;* H04J *3/00*
U.S. Cl. 364—200 21 Claims



1. An interface circuit for use in a telephone communication system having at least one distributed processor controlling at least one port station circuit, said interface circuit and said one port station circuit being in communication with a central processor over a common bus, said interface circuit interfacing said one distributed processor to said bus, said interface circuit comprising

means responsive to requests on said bus from said central processor for applying information from said one distributed processor to said bus,

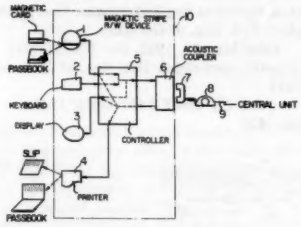
means for monitoring said bus for signals identifying said one distributed processor and accepting central processor information from said bus, and

means for establishing access to said bus by said one port station circuit and by said interface circuit such that said access is placed in a read-only mode when said one distributed processor is malfunctioning.

4,511,970
PORTABLE TERMINAL DEVICE

Yoshio Okano, and Yasuo Okuma, both of Seto, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 363,800
Claims priority, application Japan, Apr. 8, 1981, 56-52811
Int. Cl.[3] G06F *15/30*
U.S. Cl. 364—401 6 Claims



1. A portable terminal device adapted to be carried to a customer site and to perform transaction operations by transmitting and receiving data to and from a central unit through a telephone set, said portable terminal device comprising:

a card reader for receiving a transaction card on which customer data is recorded, a first control card on which transaction limiting data is recorded for limiting the scope of transactions permitted by said terminal device, said transaction limiting data including at least one limiting item data indicative of a limit of total transaction amount to be permitted, and a second control card on which data is recorded for causing the inhibiting of transactions by said terminal device, said card reader functioning for reading out the data recorded on each of said transaction, first control card and second control cards;

a keyboard for inputting transaction data;

data buffer means coupled to said keyboard and said card reader for temporarily storing the transaction data inputted from said keyboard and the customer data read out from said transaction card by said card reader;

memory means coupled to said card reader for storing said transaction limiting data read out from said first control card by said card reader;

state storing means coupled to said card reader for holding a transaction ready state in which said terminal device is ready for a transaction when said transaction limiting data is stored in said memory means and a transaction inhibit state in which said terminal device is inhibited for a transaction when said card reader reads out said second control card;

transmitting means coupled to said data buffer means for transmitting the data stored in said data buffer means to said central unit through said telephone set during a time in which said state storing means holds the transaction ready state;

accumulating means coupled to said data buffer means operative prior to the data transmission by said transmitting means to said central unit for producing an accumulation

of transactions for each limiting item of said transaction limiting data; and

means coupled to said accumulation means and said memory means for checking whether or not a value of the accumulation produced by said accumulating means exceeds a value for the corresponding limiting item of said transaction limiting data stored in said memory means, said means for checking causing the inhibition of the data transmission by said transmitting means to said central unit when the value of the accumulation exceeds the value for the corresponding item of said transaction limiting data,

whereby transactions with a plurality of customers are possible within a scope allowed by a manager of said terminal device.

4,511,971
ANTILOCKING BRAKE SYSTEM

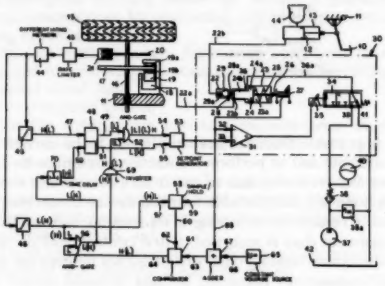
Adam Dittner, Hochstadt; Heinrich Schurr, Herzogenaurach, and Ducius Von Wallenberg, Erlangen, all of Fed. Rep. of Germany, assignors to Fag Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed May 11, 1982, Ser. No. 377,031

Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119144

Int. Cl.[3] **B60T** *8/08;* **G06F** *15/20*

U.S. Cl. 364—426 **7 Claims**



1. An antilocking brake system for a nondriven vehicle wheel having a wheel brake with a wheel-brake cylinder whose brake pressure is controlled by a brake pedal, said system comprising:

(a) signal producing means including:

means for measuring the angular velocity of the wheel and producing a first signal representing said angular velocity,

at least one acceleration-rate limiter, and

at least one differentiating network receiving said first signal for processing said first signal and delivering the respectively processed first signal respectively to first and second threshold-valve discriminators connected to said network and producing respectively a second output signal upon the deceleration of said wheel exceeding a first threshold value of substantially 10 m/s^2, and a third output signal when said deceleration is below a second threshold value of about 10 m/s^2 but lower than said first threshold value;

(b) electrohydraulic analog control means including:

a setpoint/actual value comparator producing a difference signal,

an adjustable valve connected to said comparator and responsive to said difference signal,

a braking-force reducer operated by said valve and having a spring-loaded setting piston controlling the volume of said wheel-brake cylinder independently of said brake pedal,

means for delivering said second signal to said comparator as a setpoint signal, and

means responsive to the displacement of said setting piston for generating an actual value signal and applying said actual value signal to said comparator whereby said braking-force reducer upon overbraking reduces the braking force upon said wheel;

(c) means for temporarily storing a signal value representing the braking force as said first signal falls below said second threshold value and, at least in part in response to the stored signal value, modifying said setpoint value to induce a further reduction in braking force, said valve terminating reduction in brake force upon said actual valve signal corresponding to the modified setpoint value;

(d) means responsive to the means for temporarily storing said signal value for delaying further change in said brake force while the friction between said wheel and a road surface engaged thereby remains constant, for a predetermined brief period; and

(e) means effective after the lapse of said period to increase said brake force and, upon the deceleration of said wheel again exceeding said first threshold value to repeat the operation of said analog control means in response to overbraking.

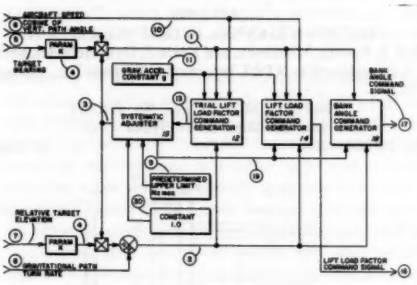
4,511,972
LARGE ANGLE, GRAVITY COMPENSATED, BANK-TO-TURN PURSUIT CONTROLLER

Lee G. Hofmann, Vestal, and Charles J. Dittmar, Jr., Binghamton, both of N.Y., assignors to General Electric Company, Binghamton, N.Y.

Filed Jan. 4, 1982, Ser. No. 336,910

Int. Cl.[3] **G06F** *15/50;* **G06G** *7/78*

U.S. Cl. 364—434 **16 Claims**



1. A system for accomplishing bank-to-turn pursuit steering of an aircraft, comprising:

Means for generating a lift load factor attenuation signal;

Means for generating first and second signals representing the components of commanded path turn rate in horizontal and vertical planes respectively, each compensated for gravitational path turn rate, the said first and second signals varying in response to and as a function of the lift load factor attenuation signal;

Means for generating a lift load factor command signal which is less than or equal to a predetermined limit, the said lift load factor command signal generating means having inputs from the first and second signals and a gravitational and aircraft performance input component;

Means for generating a bank angle command signal for use with the lift load factor command signal, the said bank angle command signal generating means having inputs of the said first and second signals, and adjusted as a function of the lift load attenuation command signal;

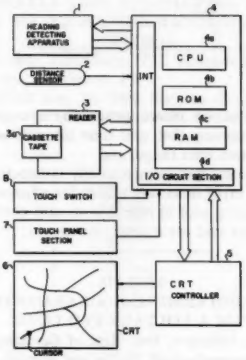
and means for coupling said bank angle command signal and said lift load factor command signal to the aircraft bank

and lift adjusting surface control elements to modify the aircraft bank angle and lift.

4,511,973
NAVIGATOR FOR VEHICLES

Kunio Miura, Okazaki, and Takashi Ono, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 20, 1982, Ser. No. 409,855
Claims priority, application Japan, Aug. 24, 1981, 56-133088; Oct. 22, 1981, 56-169071
Int. Cl.[3] G06F *15/50;* G09B *29/10*
U.S. Cl. 364—449 3 Claims



1. A navigator for vehicles comprising:

distance detector means for detecting a running distance of the vehicle to generate a distance signal;

direction detector means for detecting a travelling direction of the vehicle to generate a direction signal;

memory means for storing map data for displaying the road map of a travelling region of the vehicle and position information of a specific point of the travelling region;

display means for electronically displaying the road map and a cursor for indicating the present position of the vehicle on a display surface thereof;

first command means for generating a first command for causing said cursor to move in a predetermined direction;

second command means for generating a second command for causing said cursor to move to a position of the display surface corresponding to said specific point;

map display control means for reading the map data from said memory means to cause said display means to display the road map on the display surface thereof;

present position display control means responsive to the distance signal from said distance detector means and the direction signal from said direction detector means for determining the amount of movement of the vehicle and for causing the displayed position of said cursor to move in accordance with the amount of movement;

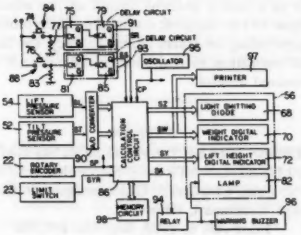
first cursor movement control means for moving the displayed position of said cursor in the direction decided by the first command from said first command means; and

second cursor movement control means responsive to the second command from said second command means for reading the position information of the specific point from said memory means to rapidly move said cursor to the position decided by said position information.

4,511,974
LOAD CONDITION INDICATING METHOD AND APPARATUS FOR FORKLIFT TRUCK

Masao Nakane, Handa; Motohiko Takahashi, Aichi, and Takaki Ogawa, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jan. 22, 1982, Ser. No. 341,678
Claims priority, application Japan, Feb. 4, 1981, 56-15536; Feb. 6, 1981, 56-17272; Feb. 9, 1981, 56-18643
Int. Cl.[3] G06F *15/20*
U.S. Cl. 364—463 9 Claims



1. A method of indicating a load condition of a forklift truck having a tilt mechanism for tilting a mast and a lift mechanism for lifting a fork along said mast, comprising the steps of:

detecting loads applied to said tilt and lift mechanisms while a cargo is placed on said fork;

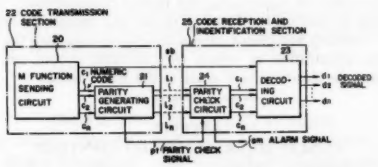
calculating a weight of said cargo and a centroid position of the same based on the detected loads applied to said tilt and lift mechanisms; and

displaying the load condition by indicating the calculated cargo weight and centroid position at least by a point which is located in a coordinate system having at least two axes one of which represents the calculated cargo weight as a first variable and the other of which represents the calculated centroid position as a second variable, said coordinate system providing a border line indicating an overload criterion area determined based on a forecast of overturn of said forklift truck.

4,511,975
NUMERICAL CONTROL MACHINE TOOL

Ryoichiro Nozawa, Tokyo; Tsuyoshi Nagamine, Hachioji; Hideaki Kawamura, Hachioji, and Mitsuto Miyata, Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP81/00242, § 371 Date May 21, 1982, § 102(e) Date May 21, 1982, PCT Pub. No. WO82/01262, PCT Pub. Date Apr. 15, 1982
PCT Filed Sep. 21, 1981, Ser. No. 387,848
Claims priority, application Japan, Sep. 25, 1980, 55-133330
Int. Cl.[3] G06F *15/46;* G05B *23/02*
U.S. Cl. 364—474 3 Claims



1. A numerical control system which is equipped to perform at least one of M, S and T functions, comprising:

a numerical controller having a code transmission means for combining a numeric code following an address character indicating one of the M, S and T functions with a redundant signal for checking the validity of the numeric code;

a plurality of transmission lines for conveying the numeric code with the redundant signal from the numerical controller;

a machine tool connected to said transmission lines, said machine tool having a code reception and identification means for receiving the signal from the code transmission means, said code reception and identification means including means for checking the validity of the received signal based on the numeric code indicating one of the M, S and T functions and the validity checking redundant signal; and

decoding means for decoding the numeric code and providing it to a heavy current circuit of the machine tool in response to the numeric code being determined valid and for generating an alarm signal to keep the machine tool out of operation in response to the numeric code being determined invalid.

4,511,976

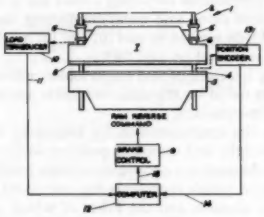
PRESS BRAKE HAVING SPRING BACK COMPENSATION STROKE REVERSAL CONTROL

Raymond J. Graf, Cincinnati, Ohio, assignor to Cincinnati Incorporated, Cincinnati, Ohio

Filed Jul. 6, 1982, Ser. No. 395,792

Int. Cl.³ G06F *15/46*; B21D *5/02*

U.S. Cl. 364—474 **25 Claims**



1. In a press brake for bending a work piece to a desired unloaded flank angle during a forming cycle of the type having a bed supporting a die member, a ram displaceable with respect to said bed, a punch member mounted on the ram and configured to engage the die to produce the desired bend, means for moving said ram toward said bed so that the punch member engages the work piece, and reversing means for reversing the direction of travel of said ram to move the punch member out of engagement with the work piece, the improvement in combination therewith comprising means for reversing the direction of ram travel at the proper point to compensate for work piece spring back and material variations in order to develop the desired unloaded flank angle including means for calculating the loading characteristics of the work piece during the forming cycle, means for deriving from said loading characteristics the theoretical unloading characteristics of the work piece, means for calculating the plastic characteristics of the work piece during the forming cycle, and means for relating said unloading and plastic characteristics to calculate the point of ram penetration at which ram reversal should occur to produce the desired flank angle in the work piece.

4,511,977

PUNCH MARKER HEIGHT CONTROL

Daryl Schuettpelz, Milwaukee, Wis., assignor to C.R.O. Inc., Menomonee Falls, Wis.

Filed Mar. 18, 1982, Ser. No. 359,238

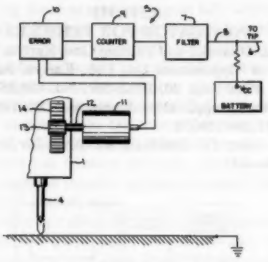
Int. Cl.³ G06F *15/46*

U.S. Cl. 364—475 **4 Claims**

1. A height control system for monitoring and adjusting the distance between a reciprocating punch marking tool and a workpiece comprising:

timing means for measuring the time interval during which the marking tool is in contact with the workpiece,

error detection means connected to the output of said timing means for comparing said time interval with a predetermined time range, said predetermined time range being indicative of an "in position" condition for the marking tool,



said error detection means generating a correction signal upon determining that said time interval is outside said predetermined time range, and

height adjustment means operatively connected to the output of said error detection means for adjusting the height of the marking tool in response to said correction signal generated by said error detection means.

4,511,978

DEVICE FOR DETERMINING A PARAMETER SIGNAL FOR A VOLTAGE-FED LOAD

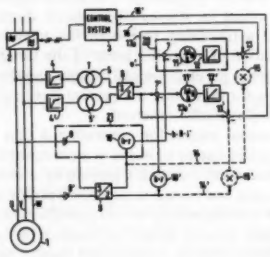
Leonhard Reng, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 10, 1982, Ser. No. 386,946

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125748

Int. Cl.³ G06G *7/62*

U.S. Cl. 364—480 **6 Claims**



1. Device for determining an operating parameter signal for a load fed by a current i and a voltage u which decreases with decreasing frequency said operating parameter defined by $\int(u'+Ri')\,dt$ correlated to a proportionality factor R, comprising:

an integrating and amplifying circuit connected to amplify the load voltage u in accordance with a transfer function $k/(1+s\cdot k/\omega_N)$, where s is a laplacian operation, ω_N is a given reference frequency of the load, and k is a proportionality factor;

a transformer connected to receive the amplified load voltage signal at its input and to provide a d-c isolated voltage signal u' at its output which is proportional to the voltage u;

a current measuring system for determining the load current i, for forming the isolated signal i', and for forming a signal R·i';

a post-transformer integrating circuit connected to receive the u' and R·i' signals and to develop an output signal corresponding to the value $\omega_N k \cdot \int (u' + k \cdot R \cdot i') \, dt$;

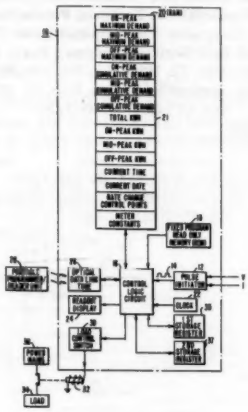
summing point means for summing the u' signal and the output signal of the post-transformer integrating circuit to provide the operating parameter signal;

wherein the proportionality factor k is chosen so that even at low frequencies the voltage u amplified in accordance with the proportionality factor k is greater than the quotient of the absolute measurement error and the maximum permissible relative transfer error $(k \cdot u > \Delta u/(\Delta u/u_{o\ max}))$ relative to a transformer input voltage u_o.

4,511,979
PROGRAMMABLE TIME REGISTERING AC ELECTRIC ENERGY METER HAVING RANDOMIZED LOAD CONTROL

Dominic Amirante, Louisburg, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 25, 1982, Ser. No. 411,220
Int. Cl.³ G01R *11/57, 11/24*
U.S. Cl. 364—481 **8 Claims**



1. An electrical energy meter for connecting to a power distribution system for measuring parameters of electrical energy usage in accord with time differentiated billing rate periods and for controlling a load, said meter comprising:

clock means for producing periodic timing pulses;

first means for accumulating said timing pulses in a manner representative of a current time;

second means for storing a plurality of preselected rate change control points, each of said plurality of rate change control points comprising a time data code, a billing rate data code, and a load control data code;

comparator means for periodically comparing said current time with said time data code of each one of said plurality of rate change control points, and for selecting a current rate change control point from said plurality of rate change control points when said current time is equal to the time data code of one of said plurality of rate change control points;

means for producing metering pulses representative of electrical energy usage;

third means for accumulating said metering pulses, said third accumulating means comprising a plurality of storage registers;

control logic means for producing a billing rate control signal in response to a billing rate data code associated with said selected current rate change control point, said billing rate control signal controlling accumulation of said metering pulses in a preselected one of said plurality of storage registers of said third accumulating means, said control logic means comprising means for selecting a least significant digit of one of said plurality of storage registers of said third accumulating means;

means for storing said selected least significant digit in a load control switch;

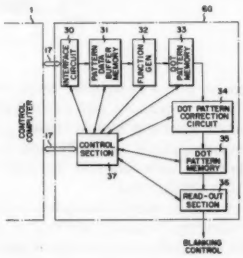
means for periodically decrementing said load control switch; and

means for selectably shedding and reconnecting a load when said load control switch is equal to a preselected value based on the binary status of said load control data code associated with said selected current rate change control point.

4,511,980
ELECTRON BEAM EXPOSURE APPARATUS

Susumu Watanabe, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 16, 1982, Ser. No. 388,936
Claims priority, application Japan, Jun. 17, 1981, 56-93408
Int. Cl.³ H01J *3/12*
U.S. Cl. 364—491 **4 Claims**



1. An electron beam exposure apparatus, comprising:

a buffer memory for temporarily storing input pattern data,

a function generator responsive to said buffer memory for converting the pattern data stored in said buffer memory into corresponding dot pattern data according to a predetermined function,

first memory means for storing dot pattern data obtained from said function generator,

means for correcting an error occurring in an individual dot in the dot pattern data obtained from said function generator and stored in said first memory means so as to obtain corrected dot pattern data,

second memory means for storing the corrected dot pattern data, and

means for directing an electron beam modulated according to the corrected dot pattern data read out from said second memory means to an exposure medium.

4,511,981
PROTECTIVE RELAYING SYSTEM

Fumio Andow, Hachiohji, and Masuo Nakashima, Urawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

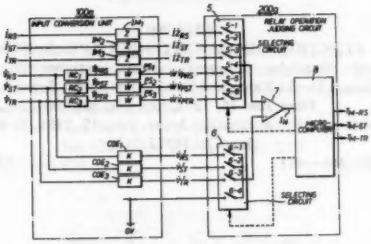
Filed Sep. 29, 1982, Ser. No. 428,327
Claims priority, application Japan, Sep. 29, 1981, 56-154142
Int. Cl.³ G06F *15/46;* **G01R** *31/08*
U.S. Cl. 364—492 **20 Claims**

1. A protective relaying system which detects a fault in an electric power system having a circuit breaker by using a current and a voltage of said electric power system and causes

said circuit breaker to trip in accordance with the fault detection so as to protect said electric power system, said protective relaying system, comprising:

input conversion means adapted for connecting said electric power system to receive a first input signal corresponding to said current and a second input signal corresponding to said voltage and for converting the magnitude and/or the phase of said first and second input signals to produce a plurality of electrical quantities including a first electrical quantity, a second electrical quantity and a third electrical quantity;

comparing means connected to said input conversion means for receiving said first, second and third electrical quantities, for comparing said first electrical quantity with said second electrical quantity to produce a first logical state



signal based on a first comparing result and comparing said third electrical quantity with a fourth electrical quantity to produce a second logical state signal based on a second comparing result cyclically, and for producing a logical state signal including said first and second logical state signals cyclically; and

digital data processing means connected to said comparing means for receiving cyclically said logical state signal, for producing a first and a second serial logical state signals based on said cyclically received first and second logical state signals, respectively, and for judging whether a phase-rotation sequence of said first and second serial logical state signals equals a predetermined sequence to produce a protection relay output signal based on the judging result, said protection relay output signal being adapted for using to trip said circuit breaker.

4,511,982

NUMERICAL CONTROL DEVICE

Mitsuo Kurakake, Hino, Japan, assignor to Fujitsu Fanuc Limited, Minamitsuru, Japan

PCT No. PCT/JP81/00157, § 371 Date Mar. 5, 1982, § 102(e) Date Mar. 5, 1982, PCT Pub. No. WO82/00210, PCT Pub. Date Jan. 21, 1982

PCT Filed Jul. 7, 1981, Ser. No. 355,724

Claims priority, application Japan, Jul. 7, 1980, 55-92383

Int. Cl.³ G06F *15/46, 11/16*

U.S. Cl. 364—167 **3 Claims**

3. A numerical control system, comprising:

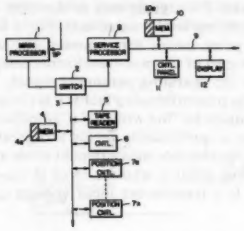
a main processor for numerical control processing;

a switching circuit operatively connected to said main processor;

peripheral circuits operatively connected to said switching circuit and including numerical control circuits and a diagnostic program memory including a first system diagnostic program executable by said main processor;

a service processor memory including a second system diagnostic program; and

a service processor, operatively connected to said switching circuit and said service processor memory, for diagnosing failure of said main processor and said peripheral circuits when said main processor fails in accordance with the second diagnostic program, said switching circuit con-



necting said service processor to said peripheral circuits when said main processor fails.

4,511,983

APPARATUS FOR CONTROLLING MICROINSTRUCTIONS STORED IN A DATA PROCESSING UNIT MEMORY

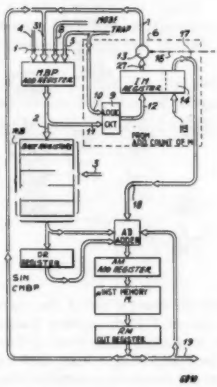
Jean-Claude M. Cassonnet, Conflans Sainte-Honorine, and Marie-Odile Lamarche née Lechevin, Pantin, both of France, assignors to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 22, 1980, Ser. No. 219,388

Claims priority, application France, Dec. 27, 1979, 79 31793

Int. Cl.³ G06F *9/00, 9/20*

U.S. Cl. 364—200 **6 Claims**



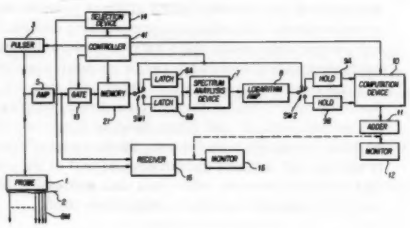
1. Apparatus for controlling microinstructions stored in a memory of a data processing unit, the microinstructions being grouped into microprogram segments, each microprogram segment being defined by a base as a function of each microprogram segment which is to executed, the apparatus comprising a memory address register for the memory, an output register for microinstructions read from the memory, said memory address register and output register respectively having outputs and inputs coupled to an address input of the memory and an output read from the memory, an adder having first and second inputs respectively responsive to (1) a signal indicating the base corresponding to the microprogram executed and (2) an output of the memory output register, the adder having an output connected to an input of the memory address register, a bank of base registers for storing bases of segments, means for addressing the base registers, outputs of the output register of the memory being connected to control inputs of the means for addressing base registers, the means for address-

ing the base registers comprising a base address register having outputs connected to address inputs of the base registers, the base address register having control inputs including: first and second inputs, the first input of the base address register loading the base address register with a binary signal contained in microinstructions of each segment, the first input corresponding to a base register in the base register bank which is addressed while the microprograms are being executed, the second input of the base address register being a signal indicative of addresses of the base registers which must be addressed while registers of the bank are loaded with signals indicative of the bases of the microprogram segments which are to be executed; and means for safeguarding the address of the base register of the bank which corresponds to a microprogram segment being executed when an interrupt occurs in the executed microprogram, the safeguarding means comprising: a safeguard register and a logic circuit including an AND gate array responsive to the address indicating output signal of the base address register and to the interrupt signal, the logic circuit deriving an output signal indicating the address of the register in the register bank containing the base segment at the time the interrupt signal occurs, means for coupling an output signal from the safeguard register to the base address register, said last named means including a logic control gate for coupling an output of the safeguard register to an input of the bank address register, the logic control gate having a control input responsive to a control signal for emptying the contents of the safeguard register into the base address register when the interrupted microprogram is resumed.

4,511,984
ULTRASOUND DIAGNOSTIC APPARATUS

Yoichi Sumino, and Susumu Enjoji, both of Ootawara, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 25, 1982, Ser. No. 411,310
Claims priority, application Japan, Sep. 19, 1981, 56-147018
Int. Cl.³ G06F *15/42*
U.S. Cl. 364—415 **17 Claims**



1. An ultrasonic diagnostic apparatus for use in evaluating characteristics of a subject, comprising:

ultrasonic probe means for transmitting ultrasonic beams having predetermined frequency spectra and for receiving reflected echo signals, said probe means scanning said subject in a predetermined cross sectional plane wth the transmitted ultrasonic beams;

pulser means connected to said ultrasonic probe means for initiating generation and transmission of ultrasonic beams by said probe means;

gate means coupled to said ultrasonic probe means for sampling reflected echo signals at predetermined sampling time periods after transmission of said ultrasonic beams by said probe means to divide said echo signals into predetermined segments corresponding to successive incremental time periods;

spectrum analysis means coupled to said gate means for obtaining frequency spectra of the echo signals of each of said segments by means of Fourier analysis;

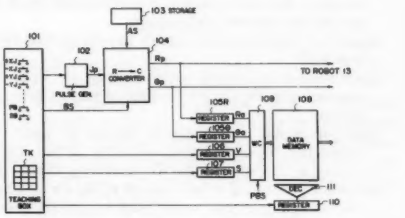
processing means coupled to said spectrum analysis means for determining a transfer function associated with each of said segments as a function of differences between the frequency spectra of successive segments and for deriving at least one frequency-dependent ultrasonic attentuation parameter based on the transfer functions associated with plural of said segments; and,

controlling means coupled to said pulser means, and said processing means for controlling the generation and scanning of said ultrasonic beams, the sampling by said gate means, and the determining of said at least one parameter by said processing means.

4,511,985
ROBOT CONTROL SYSTEM

Hajimu Inaba, Hino, and Shinsuke Sakakibara, Kunitachi, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP81/00346, § 371 Date Aug. 25, 1982, § 102(e) Date Aug. 25, 1982, PCT Pub. No. WO82/02435, PCT Pub. Date Jul. 22, 1982
PCT Filed Nov. 18, 1981, Ser. No. 413,380
Claims priority, application Japan, Dec. 30, 1980, 55-186735
Int. Cl.³ G06F *15/46;* G05B *19/42*
U.S. Cl. 364—513 **9 Claims**



1. A robot control system, comprising:

a robot having a hand which operates on the basis of a cylindrical coordinate system, where said robot operates upon receiving robot command data in a cylindrical coordinate system;

a robot control device, operatively connected to said robot, having data memory for storing the robot command data for the cylindrical coordinate system, where said robot control device provides said robot with the robot command data;

teaching means for providing instructions on the basis of a rectangular coordinate system for teaching the actions of said robot;

rectangular-to-cylindrical coordinate conversion means, operatively connected to said teaching means and said robot control device, for converting the instructions in the rectangular coordinate system from said teaching means into robot command data in the cylindrical coordinate system; and

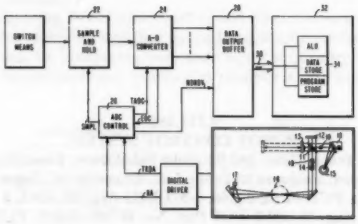
coordinate conversion means, operatively connected to the data memory, for converting the robot command data with an origin into different robot command data with a different origin, where in order to use the robot command data at a position with an origin different from the origin of said rectangular coordinate system as the basis of a teaching operation, said coordinate conversion means converts the robot command data in the data memory into the different robot command data depending upon a difference between cylindrical coordinate values of both origins.

4,511,986

METHOD AND APPARATUS FOR SIMULTANEOUSLY RECORDING MULTIPLE FT-IR SIGNALS

Robert J. Bellar, Watsonville; William G. Golden, San Jose; David D. Saperstein, Foster City, and Ashok Vats, San Jose, all of Calif., assignors to International Business Machines, Armonk, N.Y.

Filed Aug. 30, 1982, Ser. No. 413,034
Int. Cl.³ G06G 9/00; G01J 3/42
U.S. Cl. 364—576 **7 Claims**



1. Apparatus for simultaneously recording, in a single beam Fourier Transform Infrared spectrometer, multiple signals defining at least two different interferograms comprising:

switching circuit means having at least two signal terminals, having a first and a second control circuit input terminal and having one output terminal;

means for coupling input signals to said at least two signal terminals;

sample-and-hold circuit means having an input terminal connected to the output terminal of said switching circuit means;

analog-to-digital circuit means having an input terminal connected to said sample-and-hold circuit means and having an output terminal for delivering digital data;

means for generating a first control signal for synchronizing said switching circuit means with an interferometer operation;

means for generating a second control signal defining data acquisition intervals;

means for coupling said first control signal to said first control circuit input terminal to reset said switching circuit means to a predetermined state;

means for coupling said second control signal to said second control circuit input terminal to switch the state of said switching circuit means for each of said signals defining data acquisition intervals so that data samples for each of said input signals are interleaved;

computing circuit means coupled to receive the digital data from the output terminal of said analog-to-digital circuit means, said computing circuit means being operable under program control to store said digital data, and for accessing said digital data so that all data samples for the same input signal are combined to produce an interferogram for each of the input signals.

4,511,987

METHOD OF ENTERING AND PERFORMING OPERATIONS ON COMPLEX NUMBERS ON CALCULATORS

David Caldwell, and Mahendra P. Agrawal, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 25, 1982, Ser. No. 361,689
Int. Cl.³ G06F 15/02
U.S. Cl. 364—715 **25 Claims**

1. A data processing apparatus comprising:

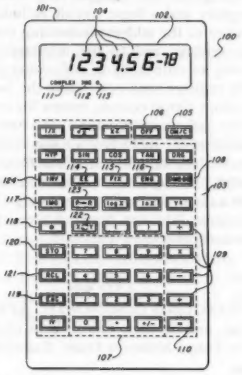
operator input means for entering numeric data and operational commands, said operational commands including (a) a first set of at least one operational command corresponding to a data processing function permitting at least one complex number operand, and (b) at least one complex number mode designation command corresponding to a mode of complex number representation;

indicator memory for storing data therein;

output means connected to said indicator memory for generating an operator perceivable indication of said data stored in said indicator memory;

second memory for storing data therein; and

arithmetic means connected to said operator input means, said indicator memory and said second memory including (a) means for performing entered operational commands on entered numeric data in a real number mode and storing the result in said indicator memory when said data processing apparatus is not in a complex number computation mode, (b) means for designating the previously entered numeric data as a first part of a complex number and the next entered numeric data as a second part of a complex number in a corresponding mode of complex number representation, and setting a corresponding complex number computation mode upon entry of a complex number mode designation command, and (c) means for performing entered operational commands from said first set of at least one operational command on entered complex number numeric data in said corresponding mode of complex number computation and storing the first part of the result in said second memory and the second part of the result in said indicator memory when said data processing apparatus is in a complex number computation mode.



4,511,988

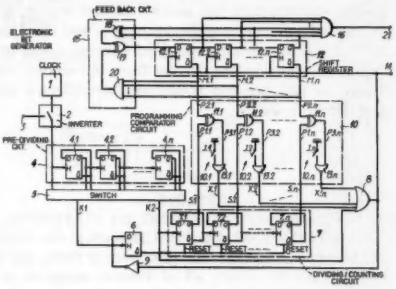
ELECTRONIC EVENT OR BIT GENERATOR HAVING A PREDETERMINED OCCURRENCE RATE WITH A PREDETERMINED EVENT OR BIT DISTRIBUTION

Urien Michel, Rue du Park Moan, Brélevenez, and Theron M. P. J. Guy, 42, rue de Lorraine, both of F-22300 Lannion, France

Filed Jul. 16, 1982, Ser. No. 398,993
Claims priority, application France, Jul. 17, 1981, 81 14312
Int. Cl.³ G06F 1/02, 15/31
U.S. Cl. 364—717 **3 Claims**

1. An electronic event generator comprising time base means having an output terminal; pseudo-random sequence generator means having an output terminal and a clock terminal; counter means having output, clock, and reset terminals; comparator means having an output terminal and a plurality of stages which are equal to the number of the length of an output binary word of the pseudo-random sequence generator means, each of said stages including an exclusive OR gate having two inputs and an output terminal, the two inputs of each exclusive OR gate being respectively connected from the outputs of the

stages having the same rank in the pseudo-random sequence generator means said in the counter means; said comparator means having one input which is connected to the output terminal of the pseudo-random sequence generator means, and another input which is connected to the output terminal of the counter means, the output terminal of the comparator means being connected to a reset terminal of the counter means and to the clock terminal of the pseudo-random sequence generator means, the clock terminal of the counter means being connected to the output terminal of the time base means; a two-



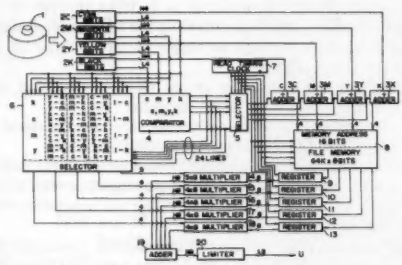
input AND gate associated with each of the exclusive OR gates, one input of each two-input AND gates being connected to the output terminal of its associated exclusive OR gate; a voltage source; a controllable switch; the other input of each AND gate being connected to said voltage source via a contact of said controllable switch; a multiple-input AND gate which is common to all the stages of the comparator, the output of each of the two input AND gates being connected to a corresponding input on the multiple-input AND gate, the output of the multiple-input AND gate being the output of the electronic event generator.

4,511,989

LINEAR INTERPOLATING METHOD AND COLOR CONVERSION APPARATUS USING THIS METHOD

Takashi Sakamoto, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed May 17, 1982, Ser. No. 378,792
Claims priority, application Japan, Jun. 18, 1981, 56-93013
Int. Cl.³ G06F *15/353*
U.S. Cl. 364—723 **6 Claims**



5. A color conversion apparatus for use in a linear interpolation method, comprising:

(a) means for separating each of (p+q) bits of digital subtractive primary colors such as cyan, magenta, yellow and black into two sets, one set of which is an address signal of p bits of the higher order (for C, M, Y, and K) for calling additive primary color signals and the other is for the lower-order q bits (for c, m, y, and k);

(b) a comparator for comparing relative magnitudes of c, m, y, and k and generating an output signal which is a function of said relative magnitudes;

(c) means for monitoring the output signals of the comparator and determining, as a function of said relative magnitudes, to which of said higher-order address signals C, M, Y, or K a unit value is to be added;

(d) memory means for preliminarily storing additive primary signals corresponding to all combinations of said p bits in the higher-order address signals, and outputting five of said additive primary signals in response to address signals output by said monitoring means;

(e) means for calculating five sets of coefficients (1−c, 1−m, 1−y, 1−k), (1−m, c−y, c−k, m−k, m−c, y−k, y−c, y−m, k−c, k−m, k−y), (m−y, m−k, m−c, y−k, y−c, y−m, k−c, k−m, k−y, c−m, c−y, c−k), (y−k, y−c, y−m, k−c, k−m, k−y, c−m, c−y, c−k, m−y, m−k, m−c) and (k, c, m, y), from the q bits of the lower-order signals and for selecting five of said coefficients as a function of said output signal of the comparator, and outputting signals corresponding to said coefficients,

(f) a plurality of multipliers for multiplying each of said coefficient signals by each of the corresponding additive primary color signals read from said memory means, and

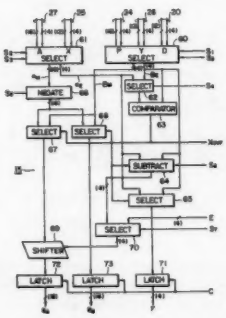
(g) an adder for adding higher-order bits obtained by the multiplication of said signals in said multipliers.

4,511,990

DIGITAL PROCESSOR WITH FLOATING POINT MULTIPLIER AND ADDER SUITABLE FOR DIGITAL SIGNAL PROCESSING

Yoshimune Hagiwara; Shizuo Sugiyama, both of Kodaira; Narimichi Maeda, Tachikawa; Osamu Yumoto, Kokubunji; Takashi Akazawa, Kodaira; Masahito Kobayashi, Yokohama; Yasuhiro Kita, Hachioji, and Yuzo Kita, Fuchu, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 15, 1981, Ser. No. 311,680
Claims priority, application Japan, Oct. 31, 1980, 55-152051
Int. Cl.³ G06F *7/48*
U.S. Cl. 364—748 **11 Claims**



1. A digital processor comprising:

a first data bus having a first number of bit lines;

interface means connected to said first data bus for receiving data to be provided on the first data bus and for transmitting data provided on the first data bus;

data storage means connected to said first data bus for storing data provided on the first data bus, each data having said first number of bits;

read means connected to said data storage means for simultaneously reading first and second data from said data storage means;

multiplication means for performing floating point multiplication on first and second data read out by said read means and both having floating point representation, and for delivering produce data with floating point representation and with a second number of bits which is larger than the first number of bits;

a second data bus having said second number of bit lines;

floating point addition means including input selection means connected to said multiplication means and said second data bus for selecting a pair of operands from the first and second read out data, the product data and data on the second data bus, extending means for selectively extending the first and second read out data into floating point data of a second number of bits when said input selection means selects either of the first and second read out data and operation means for performing floating point addition on said selected pair of operands:

transferring means connected to said operation means of said floating point addition means for selectively transferring the sum data provided therefrom onto said first or second data bus;

converting means connected to said transferring means for converting the sum data into floating point data having said first number of bits when it is necessary to provide the sum data onto the first data bus;

memory means for storing a plurality of program instructions; and

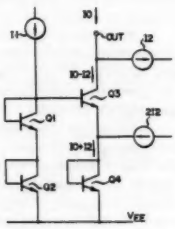
control means responsive to program instruction read out from said memory means for controlling the operations of said interface means, said data storage means, said read means, said multiplication means, said floating point addition means, and said transferring means.

4,511,991

ARITHMETIC OPERATION CIRCUIT FOR FINDING A SQUARE ROOT OF A SUM OF SQUARED VALUES

Katsumi Nagano, Shimonoseki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 3, 1982, Ser. No. 414,908
Claims priority, application Japan, Sep. 22, 1981, 56-149850
Int. Cl.³ G06G 7/22
U.S. Cl. 364—814 **5 Claims**



1. An arithmetic operation circuit for delivering an output current corresponding to a square root of a sum of two squared values, said values being represented by current delivered from first and second current sources, comprising:

a first transistor having an emitter-collector path connected at one end thereof to the first current source and to the base of said first transistor;

a second transistor having an emitter-collector path connected at one end thereof to the other end of the emitter-collector path of said first transistor and to the base of said second transistor, the other end of the emitter-collector path of said second transistor being connected to a first power source;

a third transistor having an emitter-collector path connected at one end thereof to an output terminal, the base of said third transistor being connected to said one end of the emitter-collector path of said first transistor;

a fourth transistor having an emitter-collector path connected at one end thereof to the other end of the emitter-collector path of said third transistor and to the base of said fourth transistor, the other end of the emitter-collector path of said fourth transistor being connected to said first power source; and

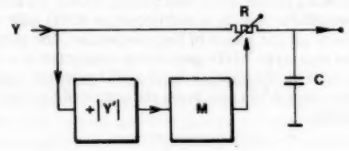
means connected to the second current source and to said third and fourth transistors for delivering a difference current, equal to the output current at the output terminal less the current from the second current source, to said one end of said emitter-collector path of said third transistor and for delivering a summed current, equal to said output current plus the current from the second current source, to said one end of said emitter-collector path of said fourth transistor.

4,511,992

SYSTEM FOR RECONSTITUTING, BY FILTERING, AN ANALOG SIGNAL FROM A PSEUDO-ANALOG SIGNAL

Bernard Dureigne; Stéphane Guerillot, both of Paris, and Alain Regnault, Chevilly Larue, all of France, assignors to Organisme Autonome Dote de la Personnalite Civile Agence France Presse, France

Filed May 6, 1982, Ser. No. 375,765
Claims priority, application France, May 8, 1981, 81 09239
Int. Cl.³ H03H 7/00
U.S. Cl. 364—825 **6 Claims**



4. A circuit for the reconstitution by filtering of an analog signal, from a pseudo-analog signal obtained by a double analog to digital, digital to analog conversion of the analog signal, said circuit processing this pseudo-analog signal issued from this said double conversion, in which analog variations in amplitude as a function of the time are represented by incremental level variations, said processing circuit including an RC network (R_3C_3) with a variable impedance to which the pseudo-analog signal is transmitted as an input through an input buffer amplifier (**10**), and providing the reconstituted signal as an output signal through an output buffer amplifier (**20**), said circuit comprising:

a. a first differentiating circuit (R_1C_1) connected to the output of the input buffer amplifier (**10**),

b. a rectifier of absolute value (**11**), receiving the signal from said first differentiating circuit (R_1C_1),

c. a sample and hold circuit (**12**) connected to the output of said rectifier (**11**), and the output signal of which is connected to a circuit for controlling the impedance of said RC network (R_3C_3),

d. a second differentiating circuit (R_2C_2), connected for its input to said rectifier of absolute value (**11**), and for its output to a second rectifier (**13**),

e. a circuit formed by a third amplifier (**14**), which receives a signal furnished by said second rectifier (**13**), and a monostable circuit (**15**), connected for its input to said third amplifier, and the signal from the output of said monostable circuit (**15**) controlling said sample and hold circuit (**12**).

4,511,993

ARRANGEMENT FOR READING OUT DEFINED DATA FROM A DIGITAL SWITCHING DEVICE WITH MUTUALLY ASYNCHRONOUS CONTROL SIGNALS FOR SEQUENTIAL SWITCHING OF THE DEVICE AND TRANSFER OF THE DATA

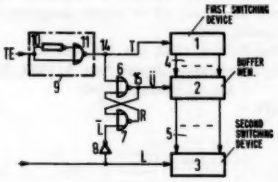
Irmfried Bromme; Reinhold Brunner, both of Munich, and Heinz Reimer, Tutzing, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,247

Claims priority, application Fed. Rep. of Germany, May 11, 1981, 3118621

Int. Cl.³ G06F *1/00*

U.S. Cl. 364—900 **8 Claims**



1. Arrangement for transfer of well-defined data from a first switching device to a second switching device, wherein the first switching device is driven by a first clock and the second switching device is driven by a second clock and wherein the first and second clocks are mutually asynchronous, the arrangement which comprises:

an output data storage being a part of the first switching device for storing the well-defined data to be transferred;

an input data storage being a part of the second switching device for receiving the data to be transferred;

a buffer storage for temporarily receiving and holding the data from the output data storage and subsequently transferring the data to the input data storage;

a clock pulse T synchronous with said first clock, operatively engaging said first switching device for initiation of the transfer of data from said output data storage to said buffer storage;

a read signal L synchronous with said second clock operatively engaging said second switching device, for initiating the transfer of said data;

a cross-connected latching gate arrangement having at least a first and a second gate, each having a first and a second gate input and an output;

said first input of said first gate operatively responsive to said clock pulse T, said second output of said second gate operatively responsive to said read pulse L;

said output of said first gate operatively producing receive signal Ü for engaging said buffer storage for receiving said data from said output storage.

4,511,994

MULTI-GROUP LRU RESOLVER

David M. Webb, Blaine, and Thomas A. Lane, New Brighton, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

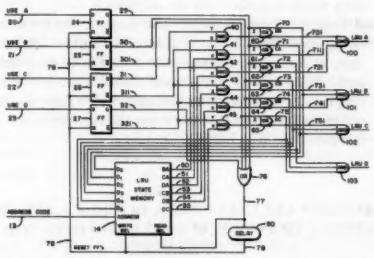
Filed Sep. 27, 1982, Ser. No. 424,665

Int. Cl.³ G06F *7/00, 7/38*

U.S. Cl. 364—900 **3 Claims**

1. In a least recently used resolving network of the type having a group address input line for receiving an address code and a plurality of use input lines, each use input line having associated with it a plurality of elements, one element from each plurality of elements being associated in an elemental group with one element from each of the other pluralities of elements, each said elemental group having associated with it a unique address code supplied on the group address input line each time an element in the group is used, a single one of the use input lines receiving in conjunction with each address code a use signal indicating use of the element associated with the use input line carrying the use signal, for resolving and recording the individual use relationships among the elements of each group and comprising:

(a) a memory storing N words, each word having bits numbered 1 through M, where N is the greatest number of elements associated with any use input line and M is the combination of the number of use input lines taken two at a time, said memory having an input line forming the group address input line, read and write select lines, and a data input line and output line for each memory bit, and storing the data present on the data input lines at the address on the group address input line responsive to a write signal on the write select line, and providing at the data output lines for a predetermined period the data stored at the location specified by the address present on the group address input line responsive to a signal on the read select line, and each similarly numbered bit is associated with first and second use input lines forming a unique combination for each set of differently numbered bits;



(b) logic network means receiving as input the signals carried by the use input lines and the memory contents received responsive to a read select signal, for supplying on the memory input lines for each of the bits 1 through M of the memory words the logical value of the expression (X AND Y) OR Z where X is the current logical value in the memory word supplied responsive to the read select signal of the memory bit involved, Y is the inverted logical value present in any use signal carried on the first use input line associated with the memory bit involved, and Z is the logical value present in any use signal carried on a second use input line associated with the memory bit involved, and wherein the logical values supplied as input to the memory comprise the desired individual use history relationship for the elements of the group associated with the address code supplied to the memory, as modified by the most recent signal on a use input line; and

(c) control means receiving the use signals on the use input lines, for supplying to the memory a read select signal responsive thereto and a write select signal a predetermined interval following the read select signal.

4,511,995

DETECTOR-DUMMY DETECTOR COMBINATION WHICH IS INTEGRATED AS A SINGLE ELEMENT OF REDUCED SIZE

LuVerne R. Peterson, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 29, 1983, Ser. No. 508,944

Int. Cl.³ G11C *19/08*

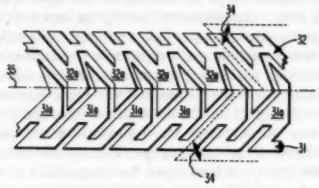
U.S. Cl. 365—8 **11 Claims**

1. A magnetic bubble memory of the type that includes a planar magnetic film containing a plurality of magnetic bubbles which move in response to a magnetic field that rotates in said plane; wherein said memory further includes an improved

detector-dummy detector mechanism for detecting said bubbles comprised of:

an elongated magnetoresistive detector member and an elongated magnetoresistive dummy detector member that lie alongside of one another on a single insulating layer at the same uniform height over said magnetic film;

said detector and said dummy detector members having fingers that extend towards each other along the direction of elongation;



said fingers of said detector member being interdigitated with the fingers of said dummy detector member such that they mesh together but do not touch;

said fingers of said detector and dummy detector members being interdigitated at angles of less than 180° and such that, at one point during each rotation of said field, magnetic poles which attract said bubbles are induced in the fingers of only said detector member to thereby make any difference in resistance between the two members indicate the presence of a bubble.

4,511,996

MEMORY CELL HAVING A DOUBLE GATE FIELD EFFECT TRANSISTOR AND A METHOD FOR ITS OPERATION

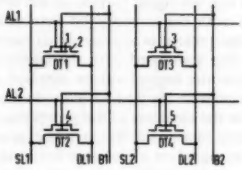
Erwin Jacobs, Vaterstetten, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,718

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138947

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—186 **10 Claims**



1. In a transistor memory cell of the type in which a semiconductor body of a first conductivity type has a boundary surface, in which a semiconductor source region of an opposite second conductivity type and a semiconductor drain region of the second conductivity type are located spaced apart in the semiconductor body at the boundary surface and adapted to receive selected operating potentials for writing, reading and erasing, in which a first gate electrode is carried insulated over a first portion of the boundary surface and thereby defines second portions of the boundary surface which extend between the first portion and the source and drain regions, the first gate electrode adapted for connection to a bit line to receive selected potentials for writing, reading and erasing, including potentials effective to produce an electrical charge shift of the threshold voltage of the transistor, and in which selection means connected in circuit with the transistor is operable in response to selection signals to prepare the memory cell for writing, reading and erasing, the improvement wherein the selection means comprises:

a second gate electrode carried insulated over said first gate electrode and extending over said second portions of said boundary surface and adapted for connection to a selection line to receive a selection potential effective to create inversion layers in said semiconductor body below said second portions of said boundary surface to effectively extend said source and drain regions towards said first gate electrode and prepare the transistor for writing, reading and erasing.

4,511,997

SEMICONDUCTOR MEMORY DEVICE

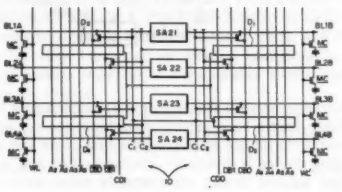
Shigeki Nozaki, Kawasaki; Yoshihiro Takemae, Tokyo, and Tomio Nakano, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 5, 1982, Ser. No. 439,507

Claims priority, application Japan, Nov. 5, 1981, 56-177477

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—189 **14 Claims**



1. A semiconductor memory device, having a semiconductor substrate and operatively connected to receive column address signals, comprising:

a plurality of sense amplifiers divided into sense amplifier groups, for providing output signals;

bit lines, operatively connected to said sense amplifiers and arrayed on the semiconductor substrate, each of said sense amplifiers being connected to a pair of said bit lines;

column decoders, operatively connected to receive the column address signals and, respectively, operatively connected to said sense amplifier groups, for selecting said sense amplifier groups;

one or more control signal lines, operatively connected to said sense amplifiers, for simultaneously selecting the output signals of at least two sense amplifiers in said sense amplifier group selected by said column decoders; and

a plurality of data buses, operatively connected to said bit lines, for transferring the output signals of at least two said sense amplifiers selected by said one or more control signal lines, to said bit lines, said sense amplifiers having said control signal lines and said data buses in common.

4,511,998

MULTIELEMENT ACOUSTIC TRANSDUCER AS WELL AS A METHOD OF MANUFACTURING THE SAME AND AN ACOUSTIC IMAGING INSTRUMENT

Hiroshi Kanda, Tokorozawa; Isao Ishikawa, Hino, and Toshio Kondo, Kunitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 226,819, Jan. 21, 1981, abandoned. This application Sep. 8, 1983, Ser. No. 530,469

Claims priority, application Japan, Jan. 21, 1980, 55-4624

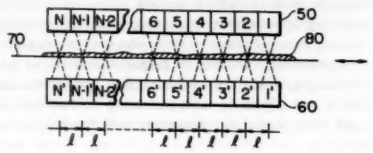
Int. Cl.³ G01N *29/00*

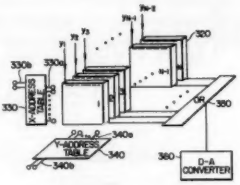
U.S. Cl. 367—11 **12 Claims**

1. In an acoustic imaging instrument wherein a predetermined object to be imaged is mechanically scanned in two dimensions in a focal zone of a focussed acoustic beam, and an

acoustic image of the object to be imaged is formed on the basis of the resultant acoustic beam;

an acoustic imaging instrument characterized in that means to form the acoustic beam includes multielement transducer means for simultaneously transmitting and receiv-



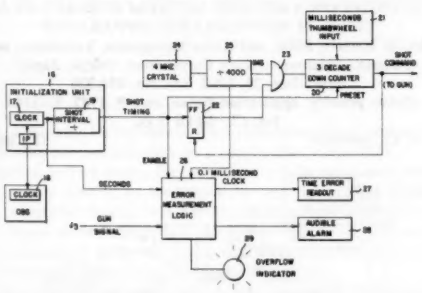


ing each beam, the multielement transducer means including a plurality of acoustic transducer elements formed at intervals each being equal to a width of the mechanical scanning, and that each of the plurality of transducer elements has a concave construction.

4,511,999
GUN SHOT CONTROL UNIT FOR SEISMIC EXPLORATION

Edgar A. Bowden, Arlington; Gordon R. Deline, Carrollton, and Gerard D. Koeijmans, Dallas, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 163,600, Jun. 27, 1980, abandoned.
This application Nov. 18, 1982, Ser. No. 442,818
Int. Cl.³ G01V *1/38, 1/08*
U.S. Cl. 367—23 **8 Claims**



1. In a seismic exploration system wherein seismic pulses are generated at regularly occurring intervals, by a seismic source which is actuated in response to a shot command signal, and received by at least one remotely located detector, a shot control unit for adjusting the time of said seismic pulses comprising:

a digital first clock which can be synchronized with a second clock provided in said remotely located detector, for producing regularly occurring first timing pulses; means responsive to said first timing pulses for producing a shot timing pulse at a time preceding one of said first timing pulses; said one timing pulse occurring at a desired time of occurrence of a seismic pulse;

an adjustable digital counter, said shot timing pulse being applied to said digital counter so that a shot command signal is generated by said digital counter at a time having an adjustable difference from said shot timing pulse, said shot command signal being applied to said seismic source to actuate it, said adjustable difference being combined with an inherent delay between said actuation of said seismic source and said shot command signal to produce a seismic pulse at said desired time;

means for producing a gun signal representing the actual time of occurrence of the actuation of said seismic source;

error measurement circuitry producing a digital error signal representing the error between the time of occurrence of said one timing pulse representing the desired time of seismic source firing and the time of occurrence of said gun signal wherein said error measurement circuitry comprises:

a second digital counter for counting clock pulses in the interval between start and stop signals applied thereto;

means responsive to the first occurrence of said gun signal or said one timing pulse for producing a start signal for said second digital counter;

means responsive to the second occurrence of said gun signal of said one timing pulse for producing a stop signal for said second digital counter;

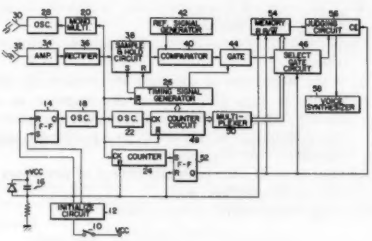
an overflow indicator connected to said second digital counter for indicating that the magnitude of said error exceeds the capacity of said digital counter; and,

means for utilizing said digital error signal so that said adjustable counter can be adjusted to minimize either a leading or lagging error.

4,512,000
OBJECT DETECTOR WHICH COMPARES RETURNED SIGNALS FROM SUCCESSIVE TRANSMISSIONS

Akinori Masuko, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 18, 1981, Ser. No. 332,296
Claims priority, application Japan, Dec. 23, 1980, 55-182363; Apr. 17, 1981, 56-57928
Int. Cl.³ G08B *13/16*
U.S. Cl. 367—93 **14 Claims**



1. An object detecting apparatus comprising:

transmitting means for periodically radiating a signal wave into a region to be monitored;

receiving means for receiving the signal wave radiated from said transmitting means and reflected from the monitored region to produce a received signal;

means for sampling the received signal from said receiving means at predetermined time intervals to produce a pulse train signal wherein the time between the pulses in the pulse train signal is proportional to the distance from the transmitting means of a detected object in said region;

means for storing the pulse train signal produced by said sampling means as a reference pulse train signal; and

judging means for comparing the pulse train signal from said

sampling means at each period of transmission of said transmitting means with the reference pulse train signal previously stored in said storing means to detect a change in position of said detected object.

4,512,001

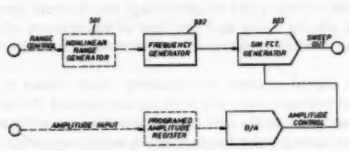
METHOD AND APPARATUS FOR SEISMIC EXPLORATION USING NONLINEAR SWEEPS

W. Harry Mayne, and Sasson Zilkha, both of Houston, Tex., assignors to Geosource Inc., Houston, Tex.

Continuation of Ser. No. 310,829, Oct. 13, 1981, abandoned. This application Mar. 6, 1984, Ser. No. 585,032

Int. Cl.³ G01V *1/28, 1/113*

U.S. Cl. 367—189 **2 Claims**



1. A method of seismic exploration, comprising the steps of:

establishing at least one seismic array at a location on the earth's surface, each said seismic array containing seismic detectors;

establishing at least one vibrator at a location on the earth's surface, each said vibrator having the capability of sweeping through a range of frequencies during a preselected sweep time and each said vibrator including a sweep generator;

generating an output signal from the sweep generator which varies as a function of time during the sweep time as follows:

$$F_0 + 0.43429\,\frac{R}{C}\left[\ln\frac{(2.3026CA_0t + 1)}{R}\right]$$

where:

t is the instantaneous value of time during the sweep in seconds;

F_0 is the frequency at which the sweep starts in Hz;

R is the range of frequencies over which the sweep varies during the sweep time;

A_0 is the initial rate of change of frequency with respect to time,

C is the logarithm to the base 10 of the ratio of the response at high frequency to the response at low frequency, where C is chosen to provide compensation for any attenuation which exists to a particular impedance boundary over the range R,

receiving seismic data with the arrays of detectors located on the earth's surface; and

recording the received seismic data.

4,512,002

TRACKING SERVO SYSTEM OF RECORDING DISC INFORMATION RECORDING AND REPRODUCING APPARATUS

Minoru Kosaka, and Toru Akiyama, both of Tokorozawa, Japan, assignors to Universal Pioneer Corporation, Tokyo, Japan

Continuation of Ser. No. 204,753, Nov. 6, 1980,. This application Apr. 4, 1983, Ser. No. 481,261

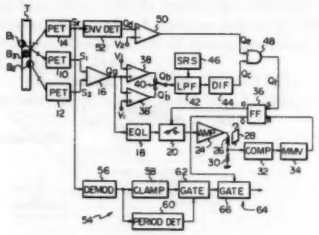
Claims priority, application Japan, Nov. 8, 1979, 54-155227[U]

Int. Cl.³ G11B *21/10*

U.S. Cl. 369—44 **9 Claims**

1. In a recording disc reproducing apparatus, which includes a pick-up unit for producing a scanning spot on a recording disc and for deflecting said scanning spot radially of said recording-disc in response to a drive signal in order to make the scanning spot trace a target track of said recording disc, and for producing an electric reproducing signal representation of a track signal recorded on said target track, said track signal containing an information signal to be reproduced and control data signals such as address signals,

a tracking servo system including tracking error signal producing means operative to produce a tracking error signal continuously variable in magnitude with an amount of deviation, if any, of said scanning spot from said target track and a pick-up unit actuating circuit for producing said drive signal in response to said tracking error signal;



a servo loop closure switch provided between said pick-up unit actuating circuit and said pick-up unit and a servo loop closure control means connected to said servo loop closure switch and operative for producing a servo loop closure command signal in accordance with said electric reproducing signal and said tracking error signal, said servo loop closure switch being operative for relaying said drive signal to said pick-up unit only when it receives the servo loop closure command signal,

control data extracting means for extracting said control data signals from said track signal; and

data signal preventing means for blocking said control data signals from being supplied to a succeeding stage when said servo loop closure signal is absent.

4,512,003

CONTROL CIRCUITRY FOR PRELIMINARY FOCUSING OF LIGHT ON A RECORD MEDIUM SURFACE IN AN OPTICAL REPRODUCING APPARATUS

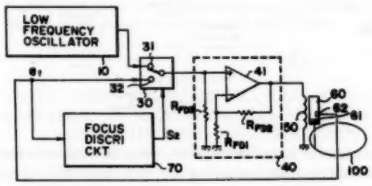
Shuichi Kimura, Shiki, and Akira Katsuyama, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 29, 1982, Ser. No. 454,330

Claims priority, application Japan, Jan. 9, 1982, 57-2146

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—45 **11 Claims**



1. In an optical reproducing apparatus including an optical pickup device directing a light beam at a record medium surface and having photodetecting means which produces a focus error signal in accordance with the state of focus of said light beam in respect to said record medium surface, and focus control means responsive to a drive signal for controlling the

focus of said light beam in respect to said record medium surface: the combination of

signal generating means operative for producing a preliminary focusing signal which initially varies rapidly toward a first predetermined level of one polarity with respect to a reference potential and then varies relatively slowly toward a second predetermined level of opposite polarity with respect to said reference potential;

detecting means for detecting a zero crossover point of said focus error signal and producing an output signal which varies from a first level to a second level when said zero crossover point is detected; and

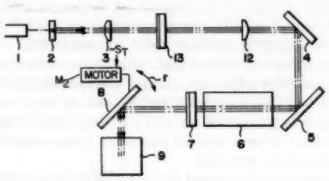
switching means operative for supplying said preliminary focusing signal to said focus control means as said drive signal for the latter when said output signal of said detecting means is at said first level and supplying said focus error signal to said focus control means as said drive signal for the latter when said output signal of said detecting means is at said second level.

4,512,004

APPARATUS FOR OPTICALLY REPRODUCING AN INFORMATION SIGNAL RECORDED ON A RECORD DISC

Chiaki Nonaka, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 24, 1983, Ser. No. 460,389
Claims priority, application Japan, Jan. 24, 1982, 57-9404
Int. Cl.³ G11B 7/00
U.S. Cl. 369—45 **11 Claims**



1. Apparatus for reproducing an information signal recorded in at least one record track on a record disc, comprising:

optical pickup means for projecting a light beam onto said record disc to be modulated by said information signal recorded therein and for reproducing said information signal in response to said modulated light beam, said optical pickup means including lens means for focusing said projected light beam onto said record disc;

focus control means for moving said lens means in response to a focusing error signal produced in response to said modulated light beam so as to focus said projected light beam onto said record disc;

light beam tracking means for rapidly moving said light beam projected onto said record disc in a direction transverse to said at least one record track to a desired position with respect to said record disc, in response to a track jump command signal; and

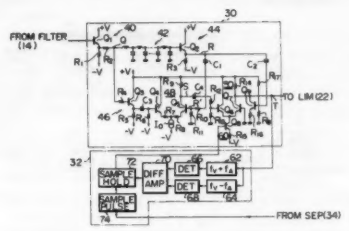
gain control means for reducing the level of said focusing error signal in response to said track jump command signal.

4,512,005

INFORMATION REPRODUCING APPARATUS IN A RECORDING DISC PLAYER

Takashi Okano, Tokorozawa, Japan, assignor to Universal Pioneer Corporation, Tokyo, Japan

Filed Jan. 18, 1982, Ser. No. 340,493
Claims priority, application Japan, Jan. 19, 1981, 56-6906
Int. Cl.³ A04N 5/91
U.S. Cl. 369—48 **3 Claims**



1. An information reproducing apparatus for reading and reproducing a first information carrier signal which is angular-modulated and is recorded together with a second information carrier signal on a rotatable recording disc in a frequency multiplex form, which comprises:

a pick-up means for reading said first and second information carrier signals from said recording disc;

a filter means for separating the read first and second information carrier signals from each other;

a demodulating means for demodulating at least said read first information carrier signal;

an equalizer means inserted between said filter means and said demodulating means, for passing therethrough said first information carrier signal and for compensating for the frequency characteristics of said pick-up means, said equalizer means having a frequency-to-gain characteristic controlled by a control signal; and

a control signal producing means for producing said control signal in response to the output signal from said equalizer means, said control signal being representative of the intensity of the extraneous components appearing in the output signal from said equalizer means, thereby to make the upper and lower side band frequencies of said first information carrier signal coincide in intensity with each other so as to compensate the degraded frequency response of said pick-up means.

4,512,006

OPTICAL TYPE INFORMATION READ/WRITE APPARATUS

Teruo Murakami, and Isao Hoshino, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 23, 1982, Ser. No. 421,731
Claims priority, application Japan, Nov. 16, 1981, 56-183268
Int. Cl.³ H04N 5/76
U.S. Cl. 369—50 **19 Claims**

1. An apparatus for storing information on a disk-shaped recording medium having a radition-sensitive layer and defining plural data storage sectors, comprising:

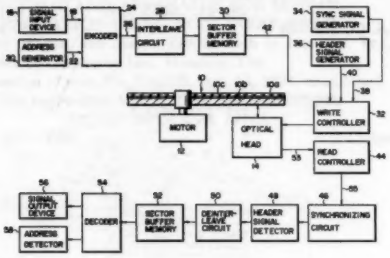
(a) first circuit means for producing a digitally encoded information signal corresponding to said information;

(b) second circuit means for producing an address signal which specifies an address in said recording medium of a respective sector in which said information signal is to be stored;

(c) third circuit means connected to said first and second circuit means, for receiving said information signal and said address signal, and for commonly interleaving both

said signals to produce an interleaved output signal to be commonly stored in said respective sector of said recording medium; and

(d) fourth circuit means connected to said third circuit means, for modulating a write beam of energy incident to



said radiation-sensitive layer of said recording medium in response to said interleaved output signal from said third circuit means so as to form on said radiation-sensitive layer said respective sector including said interleaved information address signals.

4,512,007

METHOD FOR PRODUCING A RECORD CARRIER

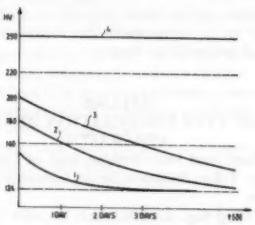
Herbert Knothe, Neumünster, and Klaus Röschmann, Schülp, both of Fed. Rep. of Germany, assignors to Teldec Telefunken-Decca-Schallplatten GmbH, Hamburg, Fed. Rep. of Germany

Filed Apr. 7, 1982, Ser. No. 366,395

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114131

Int. Cl.³ G11B *3/00*; C25D *5/48*

U.S. Cl. 369—127 **2 Claims**



1. Process for manufacturing a record carrier having a cuttable copper layer, wherein a copper layer is precipitated onto a substrate in an electrochemical bath containing copper ions and a brightener additive and a Vickers hardness ranging from about 160 to about 220 kg/mm² in the precipitated copper layer is obtained by controlling the concentration of the brightener additive, comprising: precipitating the copper layer in a recrystallizable phase, and cutting the recording while the copper layer is in its recrystallizable phase, with the temperature of the bath being held at room temperature and the record carrier being kept at a temperature below room temperature until the recording is cut to prolong the time during which recrystallization occurs.

4,512,008

SMALL SIGNAL AMPLIFYING CIRCUIT FOR A PICKUP CARTRIDGE

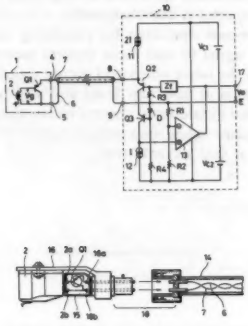
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 25, 1982, Ser. No. 411,329

Claims priority, application Japan, Sep. 11, 1981, 56-135338[U]

Int. Cl.³ G11B *3/00*; H03F *3/45*

U.S. Cl. 369—134 **12 Claims**



1. A small signal amplifying circuit comprising:

a signal source component including a pickup cartridge as a signal source, a first transistor having a base, an emitter and a collector, said signal source being coupled between said base and said collector, and first and second output terminals respectively coupled to said emitter and said collector;

an amplifier component including first and second input terminals, said second input terminal being coupled to a reference potential of said amplifier component, a third output terminal from which an output of said amplifier component produced by amplifying a signal from said signal source is derived, and a second transistor having a base, an emitter and a collector and constituting a differential amplifier of an input stage voltage amplifier together with said first transistor, said emitter of said second transistor being coupled to said first input terminal and said collector of said second transistor being coupled to said third output terminal;

the emitter of said second transistor of said amplifier component being supplied with a DC bias current to provide DC biasing of said first transistor; and

coupling means having metal contact portions and comprising lead wires for respectively coupling said first output terminal to said first input terminal and said second output terminal to said second input terminal;

said metal contact portions being detachable to break connections between the first output and first input terminals and between the second output and second input terminals.

4,512,009

STYLUS FOR STEREO PICKUPS

Werner Fidi, Baden, and Gunter Nawrata, Mistelbach, both of Austria, assignors to AKG Akustische u.Kino-Geräte Gesellschaft m.b.H., Austria

Filed Sep. 16, 1982, Ser. No. 419,028

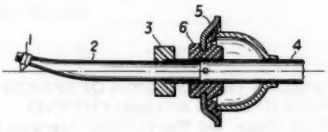
Claims priority, application Austria, Sep. 24, 1981, 4107/81

Int. Cl.³ G11B *3/46, 3/50*

U.S. Cl. 369—170 **6 Claims**

1. A stylus for stereo pickups tracking acoustic events mechanically recorded in grooves of a plate shaped record carrier, comprising a soft iron tube adapted to embody a trans-

ducer and having an open end, a needle support tube having one end engaged in said soft iron tube at said open end and having an opposite end, a needle carried by said needle support tube and having an axis substantially perpendicular to the axis of said support tube and being located adjacent the opposite end of said support tube, a support plate having an opening therethrough through which said soft iron tube extends, a first elastic element engaged with said plate in the opening thereof and embracing and elastically engaging said soft iron tube to pivotally support said soft iron tube, said soft iron tube extending entirely through said first elastic element, and a second



elastic element engaged around a portion of said soft iron tube adjacent its open end and a portion of said support tube which is adjacent the open end of said soft iron tube, said second elastic element forming a one piece damping body of a homogeneous material of high internal friction being firmly connected to the portion of said soft iron tube and said support tube which it covers, said second elastic element being smaller than said first elastic element and closer to said first elastic element than to said needle, said second elastic element being harder than said first elastic element and wherein two residual ripples in the frequency characteristic of the stereo pickup in the high frequency range are eliminated.

4,512,010

APPARATUS FOR CONTROLLING LINEAR TRACKING ARM IN RECORD PLAYER

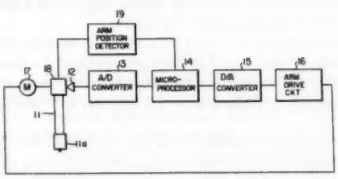
Jiro Yamada; Tetsuo Maeda, both of Neyagawa, and Hiroshi Yasuda, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 24, 1982, Ser. No. 423,267

Claims priority, application Japan, Sep. 28, 1981, 56-154309; Sep. 30, 1981, 56-156520; Sep. 30, 1981, 56-156525

Int. Cl.³ G11B *3/10*

U.S. Cl. 369—220 **4 Claims**



1. A control apparatus for a linear tracking arm in a record player, comprising:

an arm having signal pick-up means mounted at a portion thereof;

an arm base for supporting said arm;

driving means for driving linearly said arm base to drive thereby said signal pick-up means in a radial direction of a rotating record disc;

tracking error angle detecting means for detecting a tracking error angle of said arm to produce thereby an electric signal representing proportionately said tracking error angle;

a microprocessor receiving said electric signal representing proportionately said tracking error angle for arithmetically determining on the basis of the electric signal a servo output signal which is supplied to said driving means for causing said tracking error angle to be constantly zero;

said electric signal comprising an electric voltage representing proportionately said tracking error angle, said voltage being an analogue voltage which is converted into a pulse signal having a pulse width proportional to said analogue voltage before inputting to said microprocessor, said microprocessor including a memory for storing therein said tracking error angle detected at a predetermined position of said arm, said arm being movable in the vertical direction; and

a lift device which is detached from said arm when said arm is moved upwardly, said lift device being so arranged that said arm exhibits an offset angle of zero when said arm is moved upwardly, wherein said tracking error angle detected when said arm is moved upwardly is stored in the memory.

4,512,011

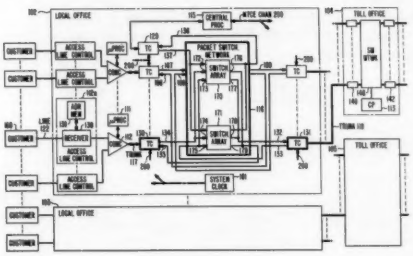
DUPLICATED NETWORK ARRAYS AND CONTROL FACILITIES FOR PACKET SWITCHING

Jonathan S. Turner, Evanston, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 1, 1982, Ser. No. 438,572

Int. Cl.³ H04J *6/00*; H04Q *11/04*

U.S. Cl. 370—60 **51 Claims**



1. Circuitry for controlling the communication of information packets among a single communication channel and a plurality of network switching arrays, comprising:

array interface means comprising communicating means for each of said arrays for concurrently transmitting and receiving packets between each of said arrays and said channel, and

common control means responsive to availability signals from said arrays and said channel for controlling the concurrent transmission and reception of said information packets to and from said communicating means for each of said arrays and said channel.

4,512,012

TIME-SWITCH CIRCUIT

Takeshi Sampei, Sagamihara; Norio Miyahara, Higashiyamato; Tadanobu Nikaido; Hiroaki Sato, both of Tokyo, and Keizo Aoyama, Yamato, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 10, 1983, Ser. No. 465,604

Claims priority, application Japan, Feb. 10, 1982, 57-20043

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—66 **9 Claims**

1. A time-switch having read and write cycles and operatively connected to receive a control signal, for use in a primary time switch of a time-space-time network, the primary time switch having a primary speech path memory, a hold memory, operatively connected to the primary speech path memory, for generating a write address for random writing into the primary speech path memory, and a time slot counter,

operatively connected to the primary speech path memory, for generating a read address for sequentially reading out of the primary speech path memory, said time switch circuit comprising:

a first memory circuit including the primary speech path memory and the time slot counter;

a second memory circuit operatively connected to said first memory circuit and including the hold memory;

said first and second memory circuits having first and second address signals and having input and output terminals, respectively, said input terminals receiving input data, each of said first and second memory circuits comprising:

a memory unit of q-words, q being an integer greater than or equal to one, and m-bits, m being an integer greater than or equal to one, for receiving and transmitting data;

an address selector, having a selection mode operatively connected to said memory unit and said first and second memory circuits, for selecting one of the first and second address signals and transmitting it to said memory unit;

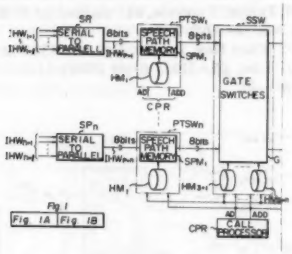
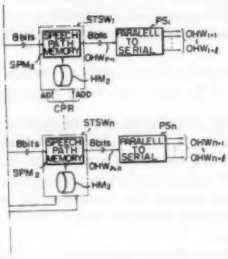


Fig. 1
Fig. 1A Fig. 1B



an address buffer, operatively connected to said address selector, for receiving and providing the first address signal to said address selector;

an m-ary counter, operatively connected to said address selector, for receiving and providing the second address signal to said address selector;

address selection mode switching means, operatively connected to said address selector for controlling the selection mode of said address selector;

write mode switching means having a write enable signal, operatively connected to said memory unit, for controlling the mode of generation of the write enable signal transmitted to said memory unit;

an input data buffer, operatively connected to said memory unit, for transmitting the input data from the input terminal to said memory unit; and

an output data buffer, operatively connected to said memory unit, for transmitting the input data from said memory unit to the output terminal;

said output terminal of said second memory circuit being connected to said input terminal of said first memory circuit, said address selection mode switching means of said first and second memory circuits being controlled so that said address selector of each of said first and second memory circuits selects the first address signal during the write cycle and selects the second address signal during the read cycle, said write mode switching means of said first memory circuit being controlled to generate the write enable signal during every write cycle, said write mode switching means of said second memory circuit being controlled to generate the write enable signal only upon receipt of the control signal during the write cycle.

4,512,013

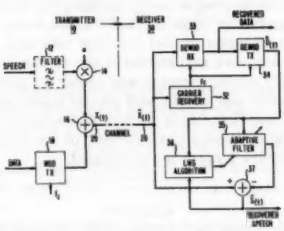
SIMULTANEOUS TRANSMISSION OF SPEECH AND DATA OVER AN ANALOG CHANNEL

Randy D. Nash, Ocean, and Wai C. Wong, Aberdeen, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 11, 1983, Ser. No. 483,879

Int. Cl.[3] **H04J** *1/02*

U.S. Cl. 370—69.1 **5 Claims**



1. A receiver comprising:

an input terminal capable of simultaneously receiving an analog speech signal which includes a predetermined power density characteristic over a predetermined bandwidth and a data signal which is received in a portion of the received analog speech signal bandwidth where the analog speech signal is present and the power density characteristic of the analog speech signal is at a low value;

a first and a second output terminal;

means responsive to a received composite analog speech and modulated data signal at the input terminal for demodulating and recovering the data signal therefrom at an output thereof for transmission to the receiver first output terminal;

means capable of remodulating the recovered data signal at the output of the demodulating and recovering means for generating an output signal corresponding substantially to the data signal received at the input terminal of the receiver;

adaptive filtering means capable of generating a first signal representative of an estimate of an impulse response of a channel connected to the input terminal of the receiver, and convolving said first signal with the remodulated data output signal from the remodulating means to generate a resultant output data signal; and

means capable of subtracting the resultant output data signal generated by the adaptive filtering means from the composite analog speech and data signal received at the input terminal of the receiver for substantially canceling the data signal forming part of the composite received signal and generating a resultant output signal at the second output terminal of the receiver which comprises the recovered analog speech signal.

4,512,014
TIME SLOT MULTIPLEX SYSTEM FOR THE DIVISION MULTIPLEXING OF DIGITAL COMMUNICATION SIGNALS

Reiner Binz, Hohenschäftlarn, and Norbert Pointner, Germering, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

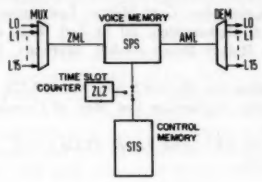
Filed Aug. 6, 1980, Ser. No. 175,692

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934379

The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.

Int. Cl.³ H04J *3/02*

U.S. Cl. 370—84 **10 Claims**



6. In a time division multiplex system for the through-coupling of digital communications signals transmitted in time channels with bit rates which are multiples of 2^n of the basic frame rate of said time division multiplex system, said multiplex system having a voice memory for storing communications signals present on an incoming multiplex line during the time slots of said time division multiplex system, a control memory for cyclically addressing said voice memory to cause the read out of data from said voice memory to an outgoing multiplex line, a time slot counter for addressing said control memory during successive time slots, and an addressing register connected to receive data to be stored in said control memory, a time slot multiplex unit comprising:

a storage device for storing data representative of said multiples;

a logic circuit connected to said storage device, to said address register, and to said time slot counter, for generating a plurality of equally spaced addresses; and

writing means connected to said logic circuit for writing data from said address register into a plurality of addresses of said control memory for a single set of data stored in said address register.

4,512,015
DIGITAL TIME-DIVISION SWITCH

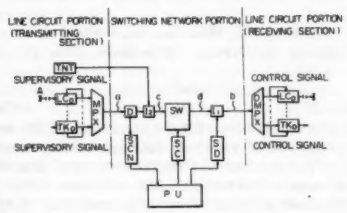
Yoshiharu Kanó ; Makoto Fujisawa, both of Yokohama; Shoji Nojiri, Kawasaki, and Yoshikazu Tanaka, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 27, 1982, Ser. No. 453,574

Claims priority, application Japan, Dec. 29, 1981, 56-213405

Int. Cl.³ H04J *3/12*

U.S. Cl. 370—110.1 **9 Claims**



1. A digital time-division switch, comprising:

line circuit portions;

a common control unit; and

a switching network portion comprising:

a supervisory signal receiver;

a multiplexer which multiplexes digitalized voice signals, supervisory signals transmitted from the line circuit portions, and which inserts said signals into predetermined time slots;

a signal-extracting circuit, operatively connected to said multiplexer and said supervisory signal receiver, which extracts said supervisory signals from time slots assigned for control signals and which transmits said extracted supervisory signals to the common control unit through said supervisory signal receiver;

a switching network, operatively connected to said common control unit, which switches data time slots;

a first signal-inserting circuit, operatively connected to said switching network and said common control unit, for transmitting control signals to said line circuit portions;

a distributor circuit, operatively connected to said first signal-inserting circuit and said line circuit portions, for distributing the voice signals and control signals to each line circuit portion; and

a second signal-inserting circuit, operatively connected between said signal-extracting circuit and said switching network, said second signal-inserting circuit inserting one-way signals into said time slots assigned for control signals, so that the one-way signals are inserted into the time slots into which supervisory signals extracted by said signal-extracting circuit were previously inserted.

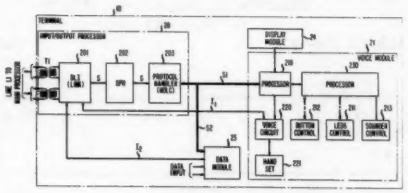
4,512,016
DIGITAL COMMUNICATION STATION SIGNALING CONTROL

Emanuel J. Fulcomer, Jr., Little Silver; Richard J. Nici, Ocean; Vance E. Poteat, Aberdeen; George W. Schramm, Oakhurst, all of N.J.; John B. Sharp, Boulder, Colo., and Michael M. Winseck, Jr., Middletown, N.J., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Feb. 4, 1983, Ser. No. 464,057

Int. Cl.³ H04J *3/12*

U.S. Cl. 370—110.1 **12 Claims**



1. A communication telephone station having a bidirectional communication line for simultaneously exchanging information and control signals over time separated information channels and over a time separated signaling channel on said line, respectively, said telephone station comprising

means for directing multibit data from at least one of said information channels over a first communication path to at least one of a plurality of communication devices,

means for accumulating an individual bit of data from each of a number of successive frames of said signaling channel into variable length signaling messages, at least one of said signaling messages containing a plurality of signaling messages, and

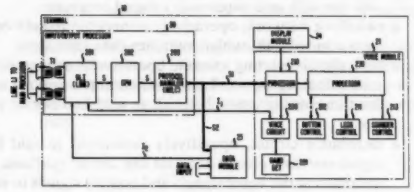
means for communicating said signaling messages over a bidirectional signaling interface to either one of said plu-

rality of communication devices, said signaling interface being separate from said communication path.

4,512,017
DIGITAL DUAL CHANNEL COMMUNICATION TERMINAL

Richard J. Nici, Ocean; George W. Schramm, Oakhurst, both of N.J., and John B. Sharp, Boulder, Colo., assignors to AT&T Information Systems, Holmdel, N.J.

Filed Feb. 4, 1983, Ser. No. 464,058
Int. Cl.³ H04J 3/12
U.S. Cl. 370—110.1 **10 Claims**



1. A telephone station having at least two communication modules, said telephone station comprising

means for simultaneously exchanging information over at least two time separated information channels of a communication line,

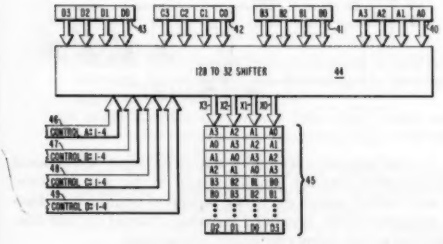
means for directing data in one of said information channels to one of said communication modules and for directing data in another one of said information channels to another one of said communication modules, and

means for exchanging signaling information over said communication line in a signaling channel that is time separated from said information channels, said signaling information being accumulated over a plurality of time frames and being directed to either one of said communication modules.

4,512,018
SHIFTER CIRCUIT

Andrew E. Phelps, and Allen Ta-Ming Wu, both of San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 8, 1983, Ser. No. 473,274
Int. Cl.³ H04J 3/00
U.S. Cl. 370—112 **12 Claims**

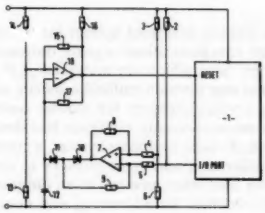


1. An array of shifter circuits arranged into N groups of M shifter circuits per group wherein both N and M are integers greater than one, each shifter circuit has P data input terminals, P control input terminals and P output terminals, where P is a positive integer, each of said P output terminals of the M shifter circuits in a group being coupled to one another, respectively, so as to form N×P output terminals of said array; each of said shifter circuits comprising P columns by P rows of transistor switching means, each having an input and an output element and a control element wherein the control element of each switching means in a row is coupled to corresponding ones of the control input terminals, the input element of each of the transistor switching means in a column being coupled to corresponding ones of the data input terminals and the output element of each of the transistor switching means in a row being coupled to respective ones of said output terminals shifted in position as a function of control signals supplied on said control input terminals.

4,512,019
MONITORING CIRCUIT FOR RESETTING MALFUNCTIONING ELECTRONIC COMPONENTS, SUCH AS MICROPROCESSORS

Bernd Bodig, Leinfelden; Gerd Höhne, Ludwigsburg, and Helmut Schmied, Remshalden, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,221
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1982, 3214006
Int. Cl.³ G06F 11/00; F02D 35/00
U.S. Cl. 371—12 **9 Claims**



1. Monitoring circuit for electronic components which in normal operation produce dynamic signals at their output, said monitoring circuit containing only one capacitor, said capacitor (12) serving for being charged by said signals, said monitoring circuit further including means (13-18) for resetting the monitored component to a defined state when said capacitor discharged to a predetermined extent, an amplifying device (7) connected to a circuit (5,9,11) for charging said capacitor (12) in response to said dynamic signals, said amplifier being provided with negative feedback coupling (8) and being connected for stopping the charging and beginning the discharging of said capacitor when said capacitor reaches a predetermined level of charge.

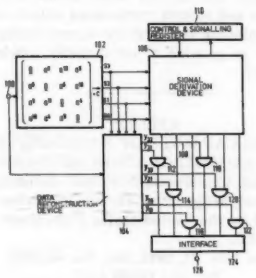
4,512,020
DATA PROCESSING DEVICE FOR PROCESSING MULTIPLE-SYMBOL DATA-WORDS BASED ON A SYMBOL-CORRECTING CODE AND HAVING MULTIPLE OPERATING MODES

Thijs Krol, Eindhoven, and Bernardus J. Vonk, Hilversum, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 13, 1982, Ser. No. 416,992
Claims priority, application Netherlands, Sep. 21, 1981, 8104342
Int. Cl.³ G06F 11/10
U.S. Cl. 371—37 **8 Claims**

1. A data processing device for the processing of data words which are composed of $k=2p-2$ data symbols by means of code words which are formed from the associated data words by means of an error-correcting code, said code words containing $n=2p$ code symbols, all symbols consisting of $m=2s$ bits and forming part of a Galois field $GF(2^m)=0, a^0, a^1 \ldots a^{2^m-2}$, p and s being integers equal or greater than 2, said device comprising a first input for a data word, first multiplier

means for multiplying the data word by a generator matrix (G) consisting of n×k matrix elements each of m bits in order to form a code word, processing means for processing the code word in order to form a processing result, and reconstruction means for reconstructing, using a parity check matrix (R)=(S)-(H)-(T) which is orthogonal to the generator matrix (G), a second data word associated with the processing result for output for a first output, said reconstruction means comprising mode indicating means (**110**), for controlling in a first state a "normal" mode for processing code words as forming part of a code providing a minimum Hamming-distance of three over the symbols, and, in n respective erasure states indicating one associated received-symbol position of a code word as erased and for processing the remaining code symbols as a code providing a minimum Hamming-distance of at least three over the bits, wherein (S) is a non-singular matrix of (mx(n−k))×(mx(n−k)) bits, the matrix (H) comprises a first submatrix of (n−k)×(n−k) symbols in the form of an identity matrix and a second submatrix of (n−k)×k symbols whose determinant is not equal to $\underline{1}=a^0$, while each (n−k)×(n−k) symbol submatrix of (H) is non-singular, the matrix (T) consisting of (nm×nm) bits in n×n blocks which are arranged in rows and columns and each of which blocks consists of m×m bits, each row and each column of blocks comprising (n−1) blocks which consist exclusively of "0" bits, each row of bits and each column of bits containing exactly one "1" bit and for the remainder exclusively "0" bits, whereby (H) produces a systematic code, which multiplied by (S) may produce a non-



systematic code and multiplied by (T) may produce permutations of symbols or bits within symbols; characterized in that said mode indicating means is a mode register having a third input and a third output and in said first state alternatively controls the processing of code words as forming part of a code providing a minimum Hamming-distance of five over the bits; in that in said second submatrix the absolute values modulo (2^m-1) of the differences between the exponents of any pair of exponents of symbols written as powers of (a) being at least equal to (m) on each respective row and in each respective column of the matrix (H), in that the reconstruction means comprise:

(a) second multiplier means (**102**) with a second input for receiving the processing result for multiplication by an extended parity check matrix (Q)=(A)×(R) of n rows of symbols by n columns of symbols to form a number of (n) syndrome symbols (**S0 . . . S3**) on a second output, wherein (A) is a matrix of (n) rows of symbols and (n−k) columns of symbols, wherein all (n−k)×(n−k) submatrices of A are non-singular so that any combination of (n−k) rows of matrix (Q) may be used as a parity check matrix, and wherein each row of matrix (Q) contains exactly one zero symbol;

(b) a data reconstruction device (**104**) with a fourth input (**100**) for receiving the processing result and a fifth input for receiving the syndrome symbols, and with a fourth output **Y32, Y31, Y30, Y21, Y20, Y10**) for forming (k^n) (k^n) versions of a reconstructed data word, each version being generated from an associated unique subset of k code symbols of the received processing result;

(c) a selection device (**106**) with a sixth input which is connected to the second output in order to receive the syndrome symbols and a seventh input which is connected to the third output in order to receive the state information from the mode register and also provided with a sixth output which is connected to the third input and a seventh output for supplying, on the basis for the syndrome symbols and the state of the mode register, a selection signal for indicating which of the (k^n) (k^n) versions of the reconstructed data word is derived from non-disturbed code symbols and supplying an update signal for the mode register;

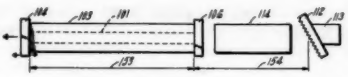
(d) a gating device (**112–122**), with inputs which are connected to the fourth output and the seventh output for the selection of an error-free data word.

4,512,021

PASSIVELY Q-SWITCHED SQUARE BORE WAVEGUIDE LASER

Peter P. Chenausky, Avon, and Richard A. Hart, Wethersfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 16, 1982, Ser. No. 369,294
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—20 **5 Claims**



1. A waveguide laser comprising a first optical cavity, having a first cavity length, including first and second mirrors and an optical waveguide having a characteristic transverse length disposed therebetween, a gain medium being disposed within said waveguide;

means for exciting said gain medium, whereby guided-wave laser radiation is resonated within said first optical cavity; and

a second freespace optical cavity coupled to said first optical cavity by said second mirror and including a radiation modulating element and a grating disposed on a side of said radiation modulating element opposite said second mirror, said second cavity having a modulating cavity length, characterized in that:

said radiation modulating element is a bleachable passive Q-switch containing a gas at a predetermined density;

said modulation cavity length being at least fifty times longer than said transverse length; and

said first cavity length is controlled to maintain said laser in stable operation whereby radiation resonated in a waveguide mode within said waveguide is coupled efficiently to radiation in a free space mode within said freespace optical cavity.

4,512,022

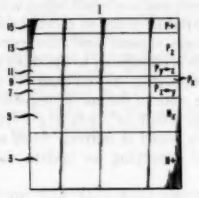
SEMICONDUCTOR LASER HAVING GRADED INDEX WAVEGUIDE

Won-Tien Tsang, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 13, 1982, Ser. No. 397,809
Int. Cl.³ H01S *3/19*
U.S. Cl. 372;45 **10 Claims**

1. A semiconductor laser comprising a first semiconductor active layer having a first bandgap, second and third layers having bandgaps larger than said first bandgap, said first layer being between said second and third layers, said second and third layers having a composition varying such that said second and third layers each have a varying refractive index with

a maximum and a minimum, said maximum being nearer said first layer than said minimum whereby waveguiding occurs, fourth and fifth semiconductor layers having first and second



conductivity types, respectively, and contacting said second and third layers, respectively, said fourth and fifth layers having bandgaps greater than those of said second and third layers, and first and second ohmic contacts to said laser.

4,512,023

ELECTRODES FOR GLASS FURNACES

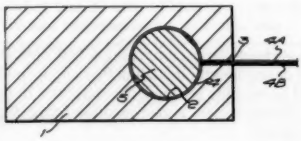
Richard J. Brinkman, Pattingham, Nr. Wolverhampton, England, assignor to Dyson Refractories Limited, England

Filed Jun. 10, 1983, Ser. No. 503,418

Claims priority, application United Kingdom, Jun. 15, 1982, 8217284

Int. Cl.³ C03B 5/027

U.S. Cl. 373—36 **8 Claims**



1. An electrode comprising an elongate ceramic electrode body, a transverse hole extending through the body towards one end thereof, a slot extending from the transverse hole and emerging at the said one end of the body, a plug member having a cross-sectional shape corresponding to the shape of the transverse hole and being a close fit therein, said plug member being formed from a chemically compatible material having expansion characteristics closely related to those of the electrode material and a wrapping of a sheet of noble metal around the plug member, the end of the sheet extending through the slot to clamping means at that end of the electrode to connect the sheet to a source of electrical supply.

4,512,024

IMPULSE AUTOCORRELATION FUNCTION COMMUNICATIONS SYSTEM

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 29, 1983, Ser. No. 508,791

Int. Cl.³ H04J 13/00; H04B 1/10

U.S. Cl. 375—34 **18 Claims**

1. A bi-orthogonal pulse code modulation communication system, comprising:

means for generating first and second multi-bit digital noise codes;

means for generating first and second RF carrier signals;

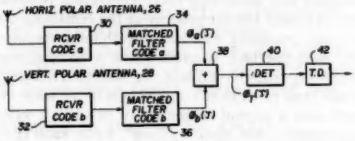
means for modulating said first and second noise codes on said first and second RF carrier signals;

first transmitting antenna means having a first type polarization coupled to said first carrier signal for radiating a first polarized RF carrier wave modulated with said first noise code;

second transmitting antenna means having a second type polarization coupled to said second carrier signal for radiating a second polarized RF carrier wave modulated with said second noise code;

first receiving antenna means having said first type polarization and being receptive of said first polarized RF carrier wave;

second receiving antenna means having said second type polarization and being receptive of said second polarized RF carrier wave;



receiver means coupled to said first and second receiving antenna means for processing respective first and second received signals containing said noise codes from said first and second polarized RF carrier waves received by said antenna means;

means coupled to said receiver means for autocorrelation detecting said first and second received signals for detecting said first and second noise codes and providing thereby first and second compressed output signals; and

means for combining said first and second compressed output signals to provide a substantially lobeless impulse output signal.

4,512,025

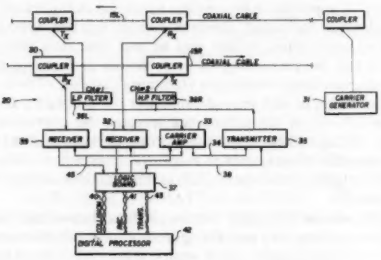
INCREASING CAPACITY OF BASEBAND DIGITAL DATA COMMUNICATION NETWORKS

Robert S. Frankel, Centereach, N.Y., and Alexander Herman, Hertzelia, Israel, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 23, 1982, Ser. No. 443,982

Int. Cl.³ H04B 3/50

U.S. Cl. 375—36 **6 Claims**



1. A digital data communication network system with collision prevention means including a plurality of stations using a particular assigned frequency bandwidth spectrum of a transmission link communicating digital signals between (a) said plurality of digital data stations, said collision prevention means being operable to prevenf interference by concurrent use of the same frequency by more than one of said stations, comprising in combination,

means including a clear channel detector for enabling the transmitting of digital signal communications from at least two of said digital data stations respectively in separate ones of said frequency bands carried simultaneously by

locally choosing one of such frequency bands within the assigned link bandwidth having a clear channel as identified by said detector, and

receiving means tuned to a selected one of said separate frequency bands carried simultaneously and including collision prevention means responsive to said detector for enabling reception on a clear channel of one of said digital communications transmitted within that assigned frequency band over said transmission link.

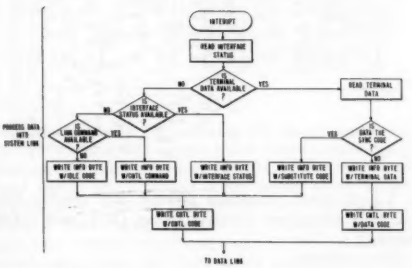
4,512,026
DATA FORMAT FOR ASYNCHRONOUS DATA TRANSMISSION

Orrie J. Vander Meiden, Boca Raton, Fla., assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Apr. 21, 1983, Ser. No. 487,423

Int. Cl.³ H04L *25/38, 7/08*

U.S. Cl. 375—114 **3 Claims**


INTERRUPT
READ INTERFACE STATUS
TERMINAL DATA AVAILABLE ?
READ TERMINAL DATA
INTERFACE STATUS AVAILABLE ?
PROCESS DATA INTO SYSTEM LINK
LINK COMMAND AVAILABLE ?
DATA THE SYNC CODE
WRITE INFO BYTE W/IDLE CODE
WRITE INFO BYTE W/CNTL COMMAND
WRITE INFO BYTE W/INTERFACE STATUS
WRITE INFO BYTE W/SUBSTITUTE CODE
WRITE INFO BYTE W/TERMINAL DATA
WRITE CNTL BYTE W/CNTL CODE
WRITE CNTL BYTE W/DATA CODE
TO DATA LINK

1. The method of transmitting digital data between terminals with a telecommunications exchange which reserves specific digital codes for internal processing, comprising the steps of:

(a) forming a data frame containing a control code and an information code, said control code having a first state when said information code contains digital data to be transmitted and having a second state when said information code does not contain digital data;

(b) detecting when an item of said digital data is identical to said digital code reserved by said exchange for internal processing;

(c) if said item of digital data is not identical to said reserved digital code, setting said control code to said first state and setting said information code equal to said item of digital data;

(d) if said item of digital data is identical to said reserved digital code, converting said identical digital data to prescribed substitute digital data;

(e) if said item of digital data is identical to said reserved digital code, setting said control code to said second state and setting said information code to said prescribed substitute digital data;

(f) transmitting said data frame to said exchange;

(g) receiving said data frame from said exchange; and

(h) if said control code is in said second state, converting said substitute data transmitted in said data frame to said identical digital data.

4,512,027
ELECTRONIC CALCULATING DEVICE WITH FACULTIES OF DETECTING REPRODUCTION LEVEL OF DATA APPLIED THERETO

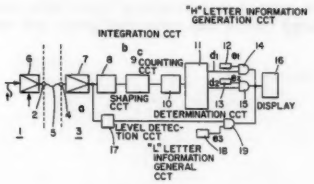
Daisuke Mochizuki, Nara; Souichi Ohnishi, Yao, and Kensaku Komai, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1980, Ser. No. 125,093

Claims priority, application Japan, Feb. 28, 1979, 54-23648; Mar. 28, 1979, 54-37224

Int. Cl.³ G07C *3/00*

U.S. Cl. 377—16 **5 Claims**



1. An electronic calculating machine including means for receiving information which is recorded on an audio tape, said information being recorded as a variable amplitude digital information signal having each pulse frequency modulated by a high frequency signal, said each pulse frequency modulated by said high frequency signal being lengthened in duration by an overvoltage condition, said means for receiving including a means for monitoring comprising:

integrator means receiving said digital information signal for integrating and rectifying said information signal to remove said high frequency signal and producing a pulse train signal;

shaping means responsive to said integrator means for defining the leading and trailing edges of said each pulse of said pulse train signal;

counter means responsive to said pulse train signal defined by said shaping means for determining the width of each pulse of said pulse train signal and producing a width signal indicative thereof;

determination means for comparing said width signal with signal representative of a predetermined desired width, said determination means producing a voltage level signal indicative of the relative voltage level of said input information signal in response to said comparison, said voltage level signal monitoring whether the voltage level of said input information is below a predetermined maximum value;

means receiving said digital information signal for determining whether the relative voltage level of said input information exceeds a predetermined minimum value;

whereby an operator may monitor said voltage level signal and said means for determining and adjust the voltage level of the information signal to a proper level for said calculating machine to receive.

4,512,028
ELECTRONIC SCANNER FOR MONITORING RUNNING THREADS AT A MULTITUDE OF LOCATIONS IN A TEXTILE MACHINE

Hansruedi Stutz, Dietlikon, Switzerland, assignor to Loepfe Brothers Limited, Wetziukon, Switzerland

Filed Feb. 28, 1983, Ser. No. 470,591

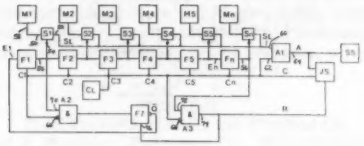
Claims priority, application Switzerland, Mar. 11, 1982, 1496/82

Int. Cl.³ D01H *13/32;* **H03K** *17/00, 21/34*

U.S. Cl. 377—16 **5 Claims**

1. An electronic scanner for monitoring a multitude of thread running locations in a textile machine, comprising:

a respective measuring head provided for each respective one of the thread running locations and serving to detect thread rupture or standstill thereat;
a series of bistable controllers, each associated with a respective one of said measuring heads;
a clock pulse generator;
each of said bistable controllers containing a data input, a clock pulse input and an output;
said bistable controllers being connected in series with one another by means of said data inputs;
said clock pulse generator acting upon said clock pulse inputs of said bistable controllers;
a plurality of switching means each containing a first input, a second input and an output;
said first input of each switching means being connected to a related one of said measuring heads and said second



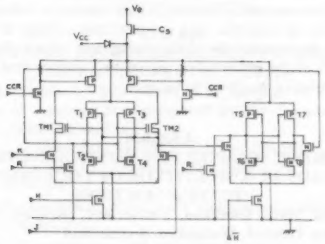
input being connected to the output of a related one of said bistable controllers;
a common signal line connected to said outputs of said switching means;
a first AND-gate having a negated first input, a second input and an output;
said negated first input of said first AND-gate being connected to said signal line and said second input thereof being connected to said clock pulse generator;
a signalling line;
an operative device responsive to thread rupture;
switching members for generating a cyclic series of initiating pulses at said data input of a first one of said series of said bistable controllers;
whereby said output of said first AND-gate is connected to said operative device via said signalling line.

4,512,029

NON-VOLATILE DECADE COUNTER USING JOHNSON CODE OR EQUIVALENT

Jean-Michel Brice, Grenoble, France, assignor to Societe pour l'Etude et la Fabrication de Circuits, Grenoble, France

Filed Sep. 29, 1982, Ser. No. 428,329
Claims priority, application France, Apr. 20, 1982, 82 06755
Int. Cl.³ H03K *23/08, 25/00*
U.S. Cl. 377—33 **8 Claims**



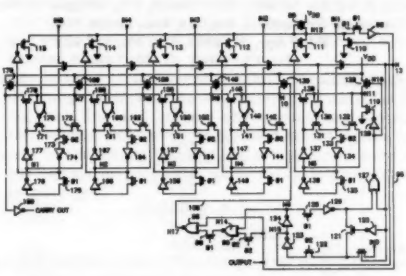
1. A non-volatile counting unit, the contents of which are stored in a non-volatile memory after every count incrementation signal applied to an input of said counting unit, and which comprises several flipflops, the outputs of which represent the contents of the counting unit in binary form, wherein said flipflops are connected with one another to provide a representation of the decimal contents of said counting unit by the logic state of said several flipflops, in accordance with a code in which no bit changes more than twice in the course of a complete counting cycle, and wherein are provided selective activating means for non-volatile memorization of said flipflop logic states, and a selection logic circuit connected to said activation means, to prohibit activation of memorization of the state of flipflops that have not changed logic state after an incrementation of the counting unit, and to enable activation of memorization of the state of flipflops that have changed logic state after such incrementation.

4,512,030

HIGH SPEED PRESETTABLE COUNTER

Masaru Fukuta, Yokohama, Japan, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 28, 1983, Ser. No. 461,837
Int. Cl.³ H03K *19/017, 21/36, 23/22*
U.S. Cl. 377—107 **5 Claims**



1. A high speed presettable counter, said counter being driven by a two-phase non-overlapping clock, said counter comprising:
a voltage source;
a plurality of counter stages, each stage comprising
logic means for storing a binary number and generating an output corresponding to said stored binary number,
a preset data input,
a preset data enable input responsive to a preset data enable signal for loading into said logic means a binary number received over said preset data input,
a carry input, and
means responsive to said stored binary number and to said carry input for generating a carry output;
a plurality of coupling transistors, each coupled between the carry output of a given counter stage and the carry input of the next higher counter stage, said coupling transistors being enabled in response to the output of said respective given counter stage;
a plurality of dynamic depletion mode (DDM) gating transistors, each coupled between said voltage source and the carry output of a respective counter stage, said DDM gating transistors being enabled in response to a gate control signal;
means responsive to all of said counter stage outputs for generating an "all zero minus one" signal when all but the lowest order counter stage output is a zero;
means responsive to said preset data enable signal for generating said gate control signal, said means including a pair of first and second enhancement mode gating transistors each responsive, respectively, to a different phase of said clock;
means responsive to said "all zero minus one" signal for generating said preset data enable signal, said means in-

cluding a third enhancement mode gating transistor responsive to one phase of said clock;

means, including a DDM transistor, in the lowest order counter stage and responsive to the binary number stored in said stage for generating said carry output from said stage, said means including a pair of fourth and fifth enhancement mode gating transistors each responsive, respectively, to a different phase of said clock,

whereby the generation of said gate control signal, of said preset data enable signal, and of said carry output from said lowest order counter stage is each delayed to allow for signal propagation delays through said counter.

4,512,031

ARRANGEMENT FOR RECEIVING TV-SIGNALS HAVING LEFT AND RIGHT STEREO SOUND SIGNALS

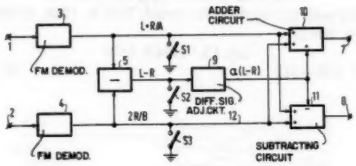
Cornelis J. M. Van Gils, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1982, Ser. No. 408,584

Claims priority, application Netherlands, Sep. 8, 1981, 8104156

Int. Cl.³ H04H *5/00*; H04N *5/60*

U.S. Cl. 381—2 **5 Claims**



1. An arrangement for receiving TV-signals containing left and right stereo sound signals, a first sound carrier being frequency-modulated by the sum signal (L+R) of the two stereo sound signals and a second sound carrier being frequency-modulated by twice the right stereo sound signal (2R), comprising a first FM-demodulator for demodulating the sum signal from the first carrier and a second FM-demodulator for demodulating twice the right stereo sound signal from the second sound carrier, a matrix circuit for deriving at least the left stereo sound signal from the sum signal and twice the right stereo sound signal, and a left and right sound channel for the respective left and right stereo sound signals, characterized in that the matrix circuit comprises a first submatrix for deriving the difference signal (L−R and/or R−L) of the two stereo sound signals from the sum signal and twice the right stereo sound signal, and a second submatrix for deriving at least the left stereo sound signal from the sum signal and the difference signal, and a difference signal adjusting circuit is coupled between the first and the second submatrices for symmetrically adjusting the crosstalk attenuation between the left and the right sound channel.

4,512,032

OPTICAL CHARACTER RECOGNITION APPARATUS

Hiromi Namba, Tokorozawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 24, 1982, Ser. No. 423,322

Claims priority, application Japan, Dec. 26, 1981, 56-209508

Int. Cl.³ G06K *9/34*

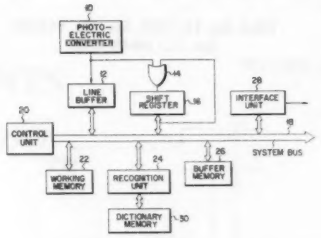
U.S. Cl. 382—9 **10 Claims**

1. An optical character recognition apparatus comprising:

photo-electric converting means for scanning printed lines of a machine printed document to produce binary signals representing quantization patterns of characters in the document;

projecting means for producing binary signals representing projection patterns in a horizontal line which coincides with the printed line of the quantization patterns of one line of the document, on the basis of the binary signals produced by said photo-electric converting means;

discriminating means, connected to said projecting means, for discriminating one of a plurality of printing pitches by determining whether or not the distance between centers of two projection patterns is within a predetermined range, which is determined by the distance between centers of two projection patterns with one or more other



projection patterns and spaces interposed therebetween in each of the plurality of printing pitches and the printing position error, and for discriminating the one printing pitch according to the determination result; and

recognizing means for determining the quantization pattern of each character from the output of said photo-electric converting means based on the one printing pitch discriminated by said discriminating means and for recognizing the character.

4,512,033

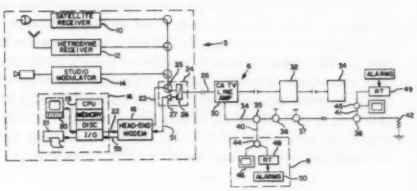
REMOTE LEVEL ADJUSTMENT SYSTEM FOR USE IN A MULTI-TERMINAL COMMUNICATIONS SYSTEM

Clifford B. Schrock, Aloha, Oreg., assignor to C-Cor Labs, Inc., Beaverton, Oreg.

Filed Nov. 29, 1982, Ser. No. 445,167

Int. Cl.³ H04B *17/00*; H04H *1/00*

U.S. Cl. 455—2 **16 Claims**



14. A method for remote level adjustment in a communications system in which a plurality of remote terminals are connected to a master terminal by a communications network for bi-directional transmission of signals between said master terminal and said remote terminals, the method comprising the steps of:

(a) transmitting a polling signal from said master terminal for causing said remote terminals to transmit output signals carrying data regarding transactions at respective remote locations;

(b) interrupting said polling signal and transmitting an interrogation signal from said master terminal for causing a selected remote terminal to transmit a reply signal;

(c) resuming said polling signal while measuring at said master terminal the level of said reply signal transmitted by said selected terminal; and

(d) temporarily interrupting said polling signal, if desirable based on said measurement, to transmit an adjustment

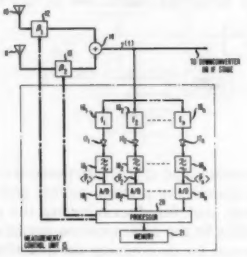
signal from said master terminal for causing said selected remote terminal to adjust its output signal level according to a predetermined protocol.

4,512,034

TECHNIQUE FOR DIGITAL RADIO SPACE DIVERSITY COMBINING

Lawrence J. Greenstein, Edison, and Yu S. Yeh, Freehold, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 11, 1983, Ser. No. 512,603
Int. Cl.³ H04B 7/08
U.S. Cl. 455—139 **5 Claims**



1. A space diversity combiner comprising:

a first and a second branch capable of propagating a first and a second concurrent input signal, respectively, received from a remote transmitter over separate channel paths

gain and phase adjusting means disposed in relation to the first and second branches and capable of adjusting the relative gain and phases of the first and second input signals in a predetermined manner in response to control signals to provide adjusted first and second input signals;

means for combining the adjusted first and second input signals at the output of the gain and phase adjusting means for generating a combiner output signal; and

measurement and control means responsive to the combiner output signal for generating noncoherent spectrum measurements over the frequency band of the combiner output signal and computing therefrom a performance measure for the space diversity combiner which accounts for both dispersion and noise and, in response to such computation, generating and applying said control signals to the gain and phase adjusting means for adjusting the relative amplitude and phase of the first and second input signals to maximize said performance measure computation.

4,512,035

METHOD OF PROGRAMMING A SYNTHESIZER ROM FOR ELIMINATION OF RECEIVER SELF-QUIETING

Alan M. Victor, Cooper City, and Darrell E. Davis, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 16, 1983, Ser. No. 495,307
Int. Cl.³ H03J 7/18; H04B 1/16
U.S. Cl. 455—165 **7 Claims**

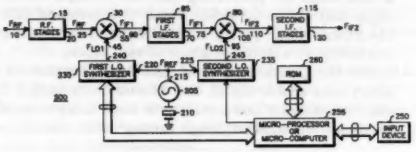
6. A method of programming a memory element for elimination of self-quieting in a synthesized multiple conversion radio receiver,

said synthesized receiver including a memory element for controlling the frequency of an oscillator used for local oscillator frequency injection into a mixer, said method comprising the steps of:

providing a desired receive frequency for receipt by said receiver, said desired receive frequency having potential to produce self-quieting in said receiver;

searching for potential receiver self-quieting spurious responses at said desired receiver frequency; and

programming said memory element to select an appropriate



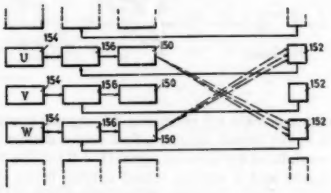
local oscillator frequency for allowing receipt of said desired receive frequency so that said receiver operates free of self-quieting when operating at said desired receiver frequency.

4,512,036

PIEZOELECTRIC APPARATUS FOR POSITIONING OPTICAL FIBERS

Herzl Laor, P.O. Box 588, Rehovot 76105, Israel

Filed Feb. 2, 1981, Ser. No. 230,794
Claims priority, application Israel, Feb. 4, 1980, 59306; Aug. 26, 1980, 60923
Int. Cl.³ H04B 9/00
U.S. Cl. 455—612 **32 Claims**



1. A communications exchange comprising:

a first plurality of electromagnetic radiation transmitting units each of which provides a beam of information bearing electromagnetic radiation;

a second plurality of electromagnetic radiation receiving units arranged in radiation receiving relationship with said first plurality;

means for causing the radiation from a selectable one of said transmitting units to be received by a selectable one of said receiving units for establishment of communications therebetween, said means for causing comprising at least one device for selectably orienting an end of an information bearing optical fiber relative to a lens thereby providing a radiation beam of variable direction,

and wherein said selectably orienting device comprises:

a bender assembly including at least two piezoelectric bender elements mounted onto each other, the elements extending in the same direction and lying in two perpendicular planes and arranged for bending motion in different directions, said bender assembly having a free end thereof arranged for association with at least one optical fiber end and a mounting end thereof located at a reference position;

means for receiving radiation transmitted by said at least one optical fiber end;

means for measuring the intensity of radiation at said receiving means; and

feedback means responsive to the intensity of radiation measured by said measuring means for governing the positioning of said at least one optical fiber end.

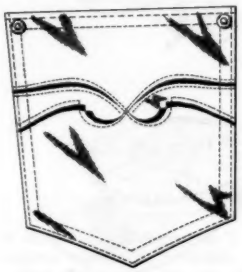
DESIGN PATENTS

GRANTED APR. 16, 1985

ERRATA

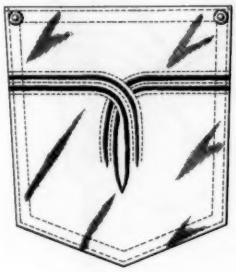
For CLASS	See PATENT NO.
D18–001	278,404

278,375
POCKET FOR JEANS OR THE LIKE
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.
Filed Sep. 22, 1982, Ser. No. 421,644
Term of patent 14 years
U.S. Cl. D2—28

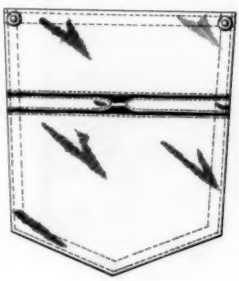


278,376
POCKET FOR JEANS OR THE LIKE
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.
Filed Sep. 22, 1982, Ser. No. 421,646
Term of patent 14 years
U.S. Cl. D2—28

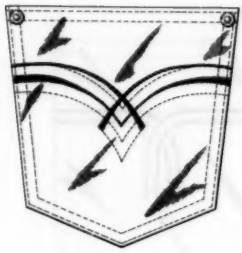
278,377
POCKET FOR JEANS OR THE LIKE
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.
Filed Sep. 22, 1982, Ser. No. 421,647
Term of patent 14 years
U.S. Cl. D2—28



278,378
POCKET FOR JEANS OR THE LIKE
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.
Filed Sep. 22, 1982, Ser. No. 421,648
Term of patent 14 years
U.S. Cl. D2—28

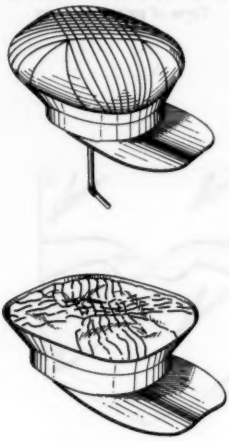


278,379
POCKET FOR JEANS OR THE LIKE
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.
Filed Sep. 22, 1982, Ser. No. 421,705
Term of patent 14 years
U.S. Cl. D2—28

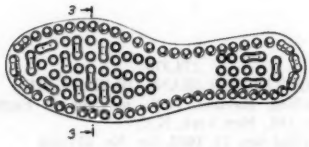


278,380
BEARD BIB
Barbara J. Verdick, 575 N. Lillian Way, Los Angeles, Calif. 90004
Filed Jul. 19, 1982, Ser. No. 399,778
Term of patent 14 years
U.S. Cl. D2—234

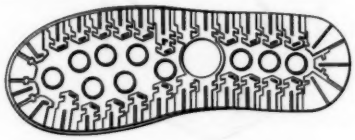
278,381
INFLATABLE DOME HAT
Timothy J. Saari, Rosemount, Minn., assignor to Jack Carmichael Advertising, Inc., Minneapolis, Minn.
Filed Dec. 3, 1982, Ser. No. 446,641
Term of patent 14 years
U.S. Cl. D2—244



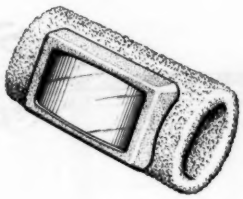
278,382
GOLF SHOE SOLE
York Chen, Taipei, Taiwan, assignor to Y. Chen & Co., Ltd., Taipei, Taiwan
Filed Sep. 17, 1982, Ser. No. 419,147
Claims priority, application Taiwan, Apr. 30, 1982, 7122219; Japan, Jun. 17, 1982, 57-27202
Term of patent 14 years
U.S. Cl. D2—320



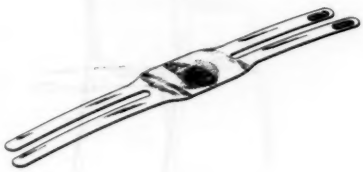
278,383
SHOE SOLE
Martin Michaeli, Sarrebourg-Hoff, France, assignor to Chaussures Mephisto S.A., France
Filed Feb. 4, 1983, Ser. No. 463,947
Term of patent 14 years
U.S. Cl. D2—320



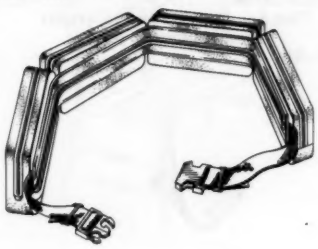
278,384
COMBINED SWEATBAND AND MIRROR
Michael C. Wilson, Glen Ellyn, Ill., assignor to The Idea Works! , Glen Ellyn, Ill.
Filed Feb. 17, 1983, Ser. No. 467,325
Term of patent 14 years
U.S. Cl. D2—360



278,385
BELT
Maud K. H. Kjellén, Hyllie Kyrkoväg 7, S-216 11 Malmö, Sweden, assignor to Maud K. H. Kjellén, Malmo, Sweden
Filed May 3, 1982, Ser. No. 374,529
Term of patent 14 years
U.S. Cl. D2—380



278,386
BATTERY PACK BELT
Seymour J. Share, P.O. Box 667, Port Orange, Fla. 32019
Filed Aug. 13, 1982, Ser. No. 407,829
Term of patent 14 years
U.S. Cl. D2—383

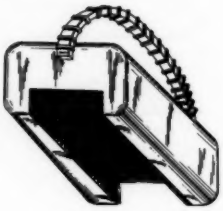


278,387
ILLUMINATED CANE
George Bixler, Modesto, Calif., assignor to Nellie Thompson, Modesto, Calif.
Filed May 26, 1982, Ser. No. 381,945
Term of patent 14 years
U.S. Cl. D3—7

278,388
POUCH
Taichi Ueda, Yokohama, Japan, assignor to Fuji Co., Ltd., Kanagawa, Japan
Filed Dec. 29, 1982, Ser. No. 454,433
Claims priority, application Japan, Jul. 7, 1982, 57-30545
Term of patent 14 years
U.S. Cl. D3—71

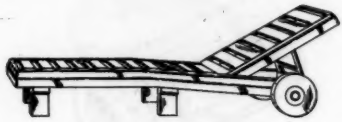
278,389
COMBINED CREEL AND GAME BAG
William B. Kircher, Johnson County, Kans., and David A. Lester, Jackson County, Mo., assignors to North Fork Industries, Inc., Kansas City, Mo.
Filed Jan. 17, 1983, Ser. No. 458,566
Term of patent 14 years
U.S. Cl. D2—38

278,390
WHEELCHAIR TIRE CLEANER
Dennis J. Bailey, P.O. Box 20293, Atlanta, Ga. 30325, assignor to Dennis James Bailey, Doraville, Ga.
Filed Jun. 23, 1983, Ser. No. 329,653
Term of patent 14 years
U.S. Cl. D4—129



278,391
CHAIR
Warren Platner, Foote's Bridge Rd., Guilford, Conn. 06437
Filed Jan. 3, 1983, Ser. No. 455,060
Term of patent 14 years
U.S. Cl. D6—366

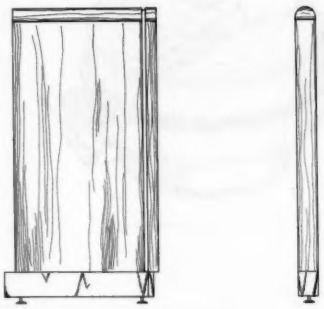
278,392
RECLINING LOUNGE CHAIR OR SIMILAR ARTICLE
Peter K. Bayly, Victoria, Australia, assignor to Roplas Pty. Ltd., Victoria, Australia
Filed Jan. 28, 1983, Ser. No. 462,121
Claims priority, application Australia, Aug. 4, 1982, 1153/82
Term of patent 14 years
U.S. Cl. D6—361



278,393
ARM CHAIR
Warren Platner, Foote's Bridge Rd., Guilford, Conn. 06437
Filed Jan. 3, 1983, Ser. No. 455,061
Term of patent 14 years
U.S. Cl. D6—374

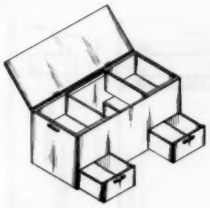
278,394
COMBINED PLATE AND FRAME STAND
George E. Goetz, and Robin E. McNutt, both of P.O. Box 185, Milford, Ohio 45150
Filed Sep. 13, 1982, Ser. No. 416,981
Term of patent 14 years
U.S. Cl. D6—310

278,395
PARTITION UNIT
Robert A. Keeler, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Sep. 29, 1982, Ser. No. 427,310
Term of patent 14 years
U.S. Cl. D6—332

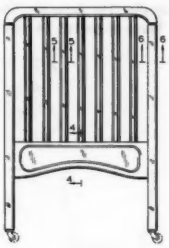


278,396
PARK BENCH
Duncan C. Syme, Chelsea; Vance R. Smith, Fish Hill, and Brian J. Tyrol, South Royalton, all of Vt., assignors to Vermont Castings, Inc., Randolph, Vt.
Filed Jun. 1, 1982, Ser. No. 383,777
Term of patent 14 years
U.S. Cl. D6—370

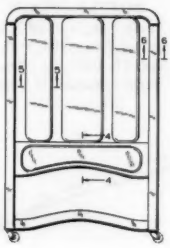
278,397
STORAGE CHEST FOR SPORTS AND OTHER PERSONAL ACCESSORIES
Anthony Frankenreiter, 5141 Ashrock Dr., St. Louis, Mo. 63129
Filed Dec. 13, 1982, Ser. No. 449,447
Term of patent 14 years
U.S. Cl. D6—440



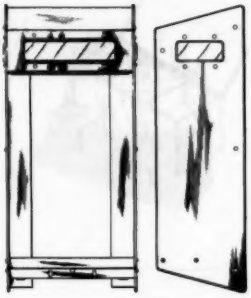
278,398
CRIB FOOTBOARD
Merlin A. Brunner; David W. Robinson, both of New London, and Harvey J. Draheim, Weyauwega, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Feb. 4, 1983, Ser. No. 463,776
Term of patent 14 years
U.S. Cl. D6—505



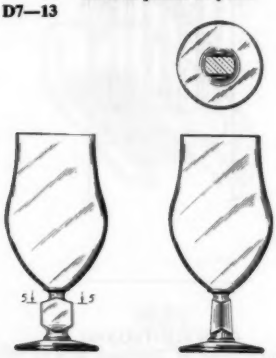
278,399
CRIB FOOTBOARD
Merlin A. Brunner; David W. Robinson, both of New London, and Harvey J. Draheim, Weyauwega, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Feb. 4, 1983, Ser. No. 463,778
Term of patent 14 years
U.S. Cl. D6—505



278,400
OUTDOOR TELEPHONE BOOTH
James M. Suttles, Elberton, Ga., assignor to Royston Manufacturing Corporation, Royston, Ga.
Filed Dec. 22, 1982, Ser. No. 452,226
Term of patent 14 years
U.S. Cl. D6—553

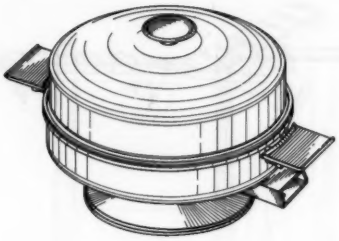


278,401
GOBLET
Pierre J. G. Assez, Steenkerque, Belgium, assignor to Durobor Societe Anonyme, Soignies, Belgium
Filed May 7, 1982, Ser. No. 376,158
Claims priority, application Benelux, Dec. 4, 1981, 02659-00
Term of patent 14 years
U.S. Cl. D7—13



278,402
BOTTLE SPOON
Stella P. Reichard, Santa Ana, Apt. 24 b, Carretera 19, Esquina Calle A, Villa Caparra, Guaynabo, P.R. 00657
Filed Aug. 11, 1982, Ser. No. 407,867
Term of patent 14 years
U.S. Cl. D7—104

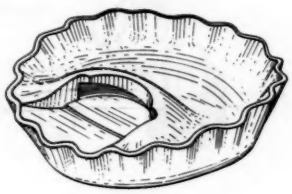
278,403
ELECTRIC SKILLET
William C. Cesaroni, Glenview, Ill., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Mar. 28, 1983, Ser. No. 479,535
Term of patent 14 years
U.S. Cl. D7—360



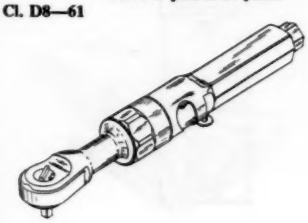
278,404
TYPEWRITER
Masayuki Morishita, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Feb. 28, 1983, Ser. No. 470,144
Claims priority, application Japan, Sep. 17, 1982, 57-42524
Term of patent 14 years
U.S. Cl. D18—1

278,405
COMBINED BOTTLE OPENER WITH SHOT MEASURER
Richard W. Birchenall, P.O. Box 24847, San Jose, Calif. 95154
Filed Dec. 27, 1982, Ser. No. 453,483
Term of patent 14 years
U.S. Cl. D8—34

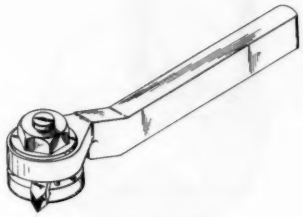
278,406
BOTTLE-OPENER
Stephan Koziol, 6120 Michelstadt, Fed. Rep. of Germany
Filed Mar. 3, 1983, Ser. No. 471,637
Term of patent 14 years
U.S. Cl. D8—38



278,407
PORTABLE PNEUMATIC TOOL HOUSING
William B. Fleischer, Jr., Ridgefield, Conn., assignor to Upneumat International, Inc., Ridgefield, Conn.
Filed Sep. 1, 1982, Ser. No. 413,731
Term of patent 14 years
U.S. Cl. D8—61



278,408
CUTTING TOOL HOLDER
Joseph A. Shampang, 676 New Britain Ave., Rocky Hill, Conn. 06067
Filed Dec. 19, 1983, Ser. No. 562,826
Term of patent 14 years
U.S. Cl. D8—98

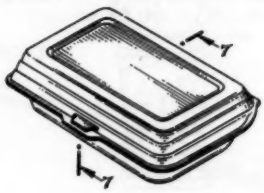


278,409
BOTTLE
Robert A. Palmer, Toronto, Canada, assignor to Greater Toronto Food Corporation, Mississauga, Canada
Filed May 2, 1983, Ser. No. 490,399
Claims priority, application Canada, Mar. 28, 1983, 28-03-83-6
Term of patent 14 years
U.S. Cl. D9—316

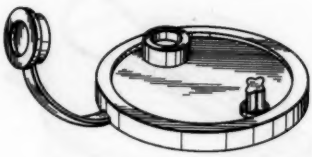
278,410
COSMETIC BOTTLE
Masaki Matsubara, Narashino, and Shuichi Ikeda, Tokyo, both of Japan, assignors to Shiseido Company Ltd., Tokyo, Japan
Filed May 17, 1982, Ser. No. 378,549
Term of patent 14 years
U.S. Cl. D9—403

278,411
BOTTLE
Povl Reitzel, Klampenborg, and Søren Carlsen, Copenhagen, both of Denmark, assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Oct. 15, 1982, Ser. No. 434,670
Claims priority, application Denmark, Apr. 15, 1982, 331/1982
Term of patent 14 years
U.S. Cl. D9—403

278,412
FOOD CONTAINER
Yat K. Yeung, Los Angeles, Calif., assignor to Sunlux Best Group, USA, Inc., Los Angeles, Calif.
Filed Nov. 4, 1982, Ser. No. 439,261
Claims priority, application United Kingdom, May 11, 1982, 1006650
Term of patent 14 years
U.S. Cl. D9—420

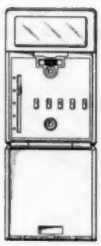


278,413
DISPENSING CLOSURE
Charles M. Woodcock, and Randy Kliment, both of Trenton, N.J., assignors to General Foods Corporation, White Plains, N.Y.
Filed Mar. 2, 1982, Ser. No. 353,988
Term of patent 14 years
U.S. Cl. D9—446



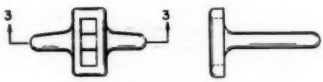
278,414
BOTTLE CAP FOR EDIBLE OIL
Joong H. Cho, 1097-2 Myunmok-Dong, Dongdaemun-ku, Seoul, Rep. of Korea
Filed Nov. 24, 1982, Ser. No. 444,444
Term of patent 14 years
U.S. Cl. D9—446

278,415
WALL TIMER
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.
Filed Jun. 30, 1983, Ser. No. 509,422
Term of patent 14 years
U.S. Cl. D10—40

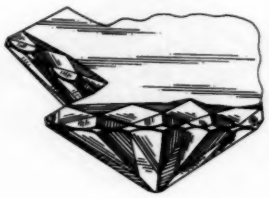


278,416
BARRICADE
Thomas F. Moran, 540 Cobblestone, Aurora, Ohio 44202
Filed May 2, 1983, Ser. No. 490,557
Term of patent 14 years
U.S. Cl. D10—109

278,417
GEMLESS RING
Maxwell P. Lewis, 1229 Grouse Dr., Pittsburgh, Pa. 15243
Filed Sep. 29, 1982, Ser. No. 426,846
Term of patent 14 years
U.S. Cl. D11—27



278,418
PRECIOUS, SEMIPRECIOUS OR SYNTHETIC CUT STONE
Daniel Nejman, Irving, Tex., assignor to Chadiam Diamond Mfg., Inc., Dallas, Tex.
Filed Nov. 7, 1983, Ser. No. 548,974
Term of patent 14 years
U.S. Cl. D11—90

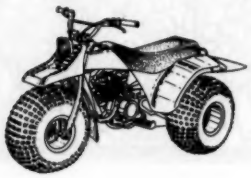


278,419
CHRISTMAS TREE ORNAMENT
James J. Hill, Plantation, Fla., assignor to Cook International, Inc., Palm Beach, Fla.
Filed Apr. 20, 1983, Ser. No. 486,813
Term of patent 14 years
U.S. Cl. D11—121

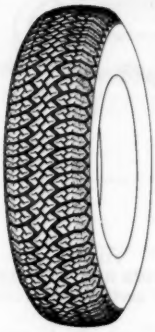
278,420
ILLUMINATED PICTURE BOX
Lawrence E. Thompson, 7608 Monroe St., Hammond, Ind. 46324
Filed Sep. 27, 1982, Ser. No. 425,123
Term of patent 14 years
U.S. Cl. D11—136

278,421
FIGURINE OF A QUAIL
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Jun. 17, 1982, Ser. No. 389,541
Term of patent 14 years
U.S. Cl. D11—162

278,422
MOTORTRICYCLE
Tsuyoshi Murakami, Shizuoka, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Kamimura Takatsuka, Japan
Filed Apr. 28, 1982, Ser. No. 372,685
Term of patent 14 years
U.S. Cl. D12—110

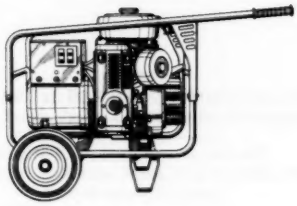


278,423
TIRE
Andre E. J. Baus, Bettembourg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jul. 1, 1983, Ser. No. 510,005
Term of patent 14 years
U.S. Cl. D12—147

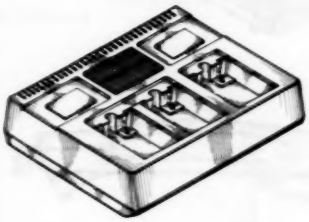


278,424
CAMPER RACK FOR HOLDING SKIS AND THE LIKE
Dannie R. L. Kern, 2016 Quadros La., San Jose, Calif. 95131
Filed Apr. 15, 1982, Ser. No. 368,758
Term of patent 14 years
U.S. Cl. D12—157

278,425
POWER GENERATOR
Shibuya Toshihiko, Urawa, Japan, assignor to Honda Gikken Kogyo Kabushiki Kaisha, Japan
Filed Apr. 30, 1982, Ser. No. 373,516
Claims priority, application Japan, Nov. 2, 1981, 56-48944
Term of patent 14 years
U.S. Cl. D13—1

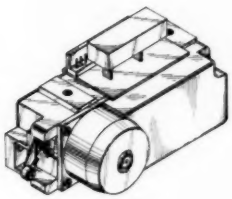


278,426
BATTERY CHARGER
Dennis M. Lanci, Renton, and Larry J. Peters, Snohomish, both of Wash., assignors to Physio-Control Corporation, Redmond, Wash.
Filed Mar. 25, 1983, Ser. No. 478,734
Term of patent 14 years
U.S. Cl. D13—5

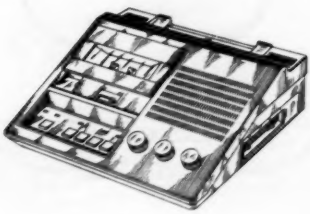


278,427
PUMP INTERFACE
Paul D. Eckstedt, Campbell, and Robert W. Caton, Morgan Hill, both of Calif., assignors to FMC Corporation, Chicago, Ill.
Filed Mar. 14, 1983, Ser. No. 475,277
Term of patent 14 years
U.S. Cl. D13—12

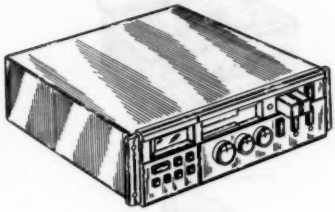
278,428
OPTICAL READ OUT PICKUP FOR USE IN AN OPTICAL AUDIO DISC MACHINE OR THE LIKE
Yasutaka Tsuchihashi, and Kenichi Ito, both of Okaya, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Sep. 1, 1982, Ser. No. 413,805
Claims priority, application Japan, Mar. 18, 1982, 57-11330
Term of patent 14 years
U.S. Cl. D14—1



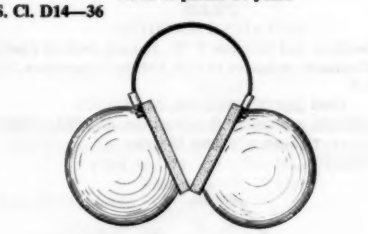
278,429
DICTATING MACHINE
Peter J. Doodson, and Stefanus F. W. Joosten, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 27, 1982, Ser. No. 423,972
Claims priority, application Benelux, Apr. 19, 1982, 56782-00
Term of patent 14 years
U.S. Cl. D14—3



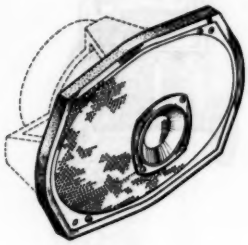
278,430
COMBINED AUTOMOBILE TAPE PLAYER AND RADIO RECEIVER
Rebertus van de Poel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 20, 1982, Ser. No. 451,518
Claims priority, application Benelux, Jun. 29, 1982, 56968-02
Term of patent 14 years
U.S. Cl. D14—5



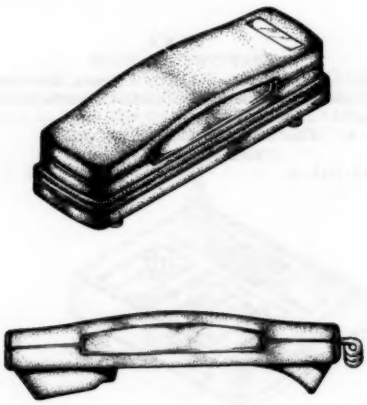
278,431
ACOUSTIC REFLECTOR HEADSET
Kenneth K. Beard, 1609 S. Columbia Ave., Tulsa, Okla. 74104
Filed Aug. 27, 1982, Ser. No. 412,128
Term of patent 14 years
U.S. Cl. D14—36



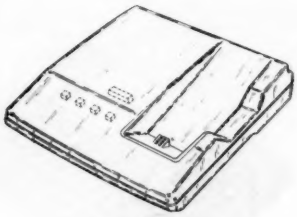
278,432
GRILLE ASSEMBLY FOR A COAXIAL LOUDSPEAKER
Marshall D. Buck, Los Angeles, Calif., assignor to Cerwin-Vega, Inc., Arleta, Calif.
Filed Sep. 30, 1982, Ser. No. 429,553
Term of patent 14 years
U.S. Cl. D14—39



278,433
TELEPHONE
George D. Perkins, Eugene, Oreg., assignor to American Telecommunications Corporation, El Monte, Calif.
Filed Nov. 15, 1982, Ser. No. 441,414
Term of patent 14 years
U.S. Cl. D14—53



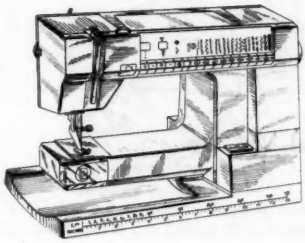
278,434
WIRELESS TELEPHONE SYSTEM BASE UNIT OR THE LIKE
Bengt A. Nestell, Belle Mead, N.J., assignor to GTE Communication Systems Corporation, Northlake, Ill.
Filed Dec. 16, 1982, Ser. No. 450,409
Term of patent 14 years
U.S. Cl. D14—60



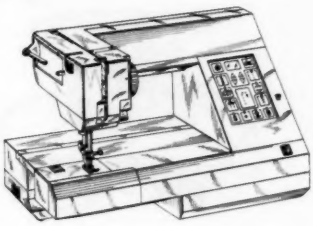
278,435
I/O TERMINAL FOR DATA COMMUNICATION
Koji Hikawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Nov. 17, 1982, Ser. No. 442,247
Claims priority, application Japan, May 25, 1982, 57-022764
Term of patent 14 years
U.S. Cl. D14—101

278,436
LIFT HITCH PIN
John W. Storlie, Box 56, Santiago, Minn. 55377
Filed May 6, 1983, Ser. No. 492,177
Term of patent 14 years
U.S. Cl. D15—28

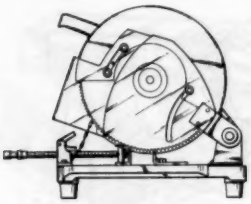
278,437
SEWING MACHINE
Lars G. Rosenblad, Huskvarna, Sweden, assignor to Husqvarna Aktiebolag, Huskvarna, Sweden
Filed Mar. 29, 1982, Ser. No. 362,624
Claims priority, application Sweden, Sep. 29, 1981, 812135
Term of patent 14 years
U.S. Cl. D15—68

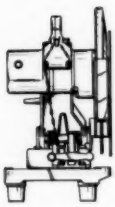


278,438
SEWING MACHINE
Giorgetto Giugiaro, Moncalieri, Italy, assignor to Necchi S.p.A., Pavia, Italy
Filed Jun. 4, 1982, Ser. No. 384,995
Term of patent 14 years
U.S. Cl. D15—70

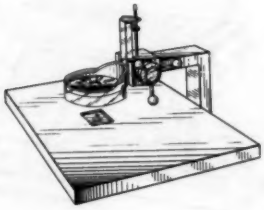


278,439
CUTTER
Kouzou Hakoda, Fukuyama, Japan, assignor to Ryobi Limited, Hiroshima, Japan
Division of Ser. No. 407,776, Aug. 13, 1982,. This application Sep. 13, 1984, Ser. No. 649,942
Claims priority, application Japan, Feb. 15, 1982, 57-6393; Mar. 9, 1982, 57-9734
Term of patent 14 years
U.S. Cl. D15—127

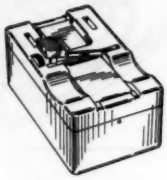




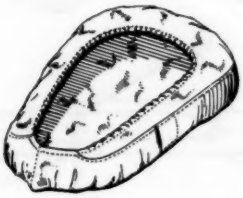
278,440
ROUTER TABLE
Irwin J. Ferdinand, Glencoe; Richard Sylvan, Glenview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Oct. 21, 1982, Ser. No. 435,758
Term of patent 14 years
U.S. Cl. D15—141



278,441
FILM CUTTING APPARATUS
Rudolph Hanke, Monheim, Fed. Rep. of Germany, assignor to Hama Hamaphot KG Hanke & Thomas, Monheim, Fed. Rep. of Germany
Filed Jun. 1, 1982, Ser. No. 383,782
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3 AR 107/82
Term of patent 14 years
U.S. Cl. D16—40



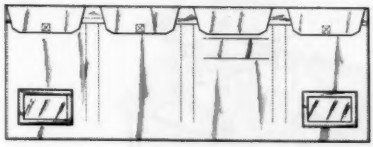
278,442
STRINGED INSTRUMENT COVER
Roxane L. Whomsley, 9932 Cris Ave., Anaheim, Calif. 92804
Filed Nov. 22, 1982, Ser. No. 443,171
Term of patent 14 years
U.S. Cl. D17—20



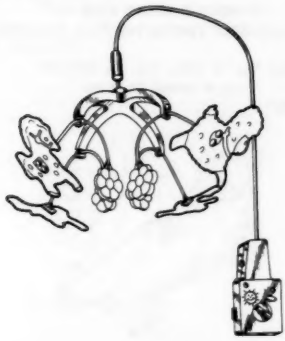
278,443
TYPEWRITER
Masayuki Morishita, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Feb. 28, 1983, Ser. No. 470,496
Claims priority, application Japan, Sep. 17, 1982, 57-42522
Term of patent 14 years
U.S. Cl. D18—1

278,444
TYPEWRITER
Ishin Miyamoto; Yasuo Nagamatsu; Toshiya Moriyama, and Masaharu Sakamoto, all of Fukuoka, Japan, assignors to Kyushu Matsushita Electric Co., Ltd., Fukuoka, Japan
Filed Mar. 24, 1983, Ser. No. 478,583
Term of patent 14 years
U.S. Cl. D18—1

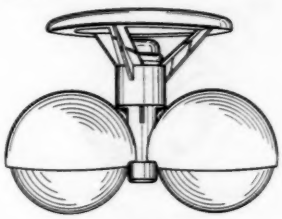
278,445
DOCUMENT ORGANIZER
Sheryl J. Hartney, Barrington, R.I., assignor to Saab-Scania of America, Inc., Orange, Conn.
Filed Sep. 30, 1982, Ser. No. 432,542
Term of patent 14 years
U.S. Cl. D19—26



278,446
ACTION MOBILE
Stanley M. Kujawski, and Andrew I. Bergman, both of East Aurora, N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 5, 1982, Ser. No. 346,189
Term of patent 14 years
U.S. Cl. D21—63

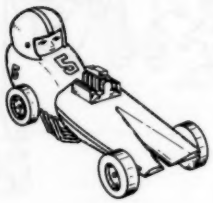


278,447
TOY VEHICLE
Arieh Solomon, 49, Hasaifan St., Ramat Hasharon 47248, Israel
Filed Jul. 7, 1982, Ser. No. 396,052
Claims priority, application Israel, Jan. 12, 1982, 8854
Term of patent 14 years
U.S. Cl. D21—76

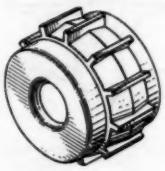


278,448
TOY STABLE
Elizabeth Knight, Milton, and Richard Barlik, North Attleboro, both of Mass., assignors to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Apr. 11, 1983, Ser. No. 484,411
Term of patent 14 years
U.S. Cl. D21—116

278,449
MODEL RACING CAR
Lester M. Colquitt, 8225 Tumbleweed Trail, Knoxville, Tenn. 37920
Filed Dec. 8, 1982, Ser. No. 447,791
Term of patent 14 years
U.S. Cl. D21—137

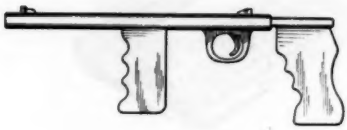


278,450
WHEEL FOR TOY AMPHIBIOUS VEHICLE
Adolph E. Goldfarb, 1432 SE. Wind Cir., Westlake Village, Calif. 91361, and Delmar K. Everitt, Woodland Hills, Calif., assignors to Adolph E. Goldfarb, Westlake Village, Calif.
Filed Dec. 20, 1982, Ser. No. 451,087
Term of patent 14 years
U.S. Cl. D21—141



278,451
TOY RIFLE
Paul B. Makhoulian, 27445 Hystone, Farmington Hills, Mich. 48018
Filed Dec. 9, 1982, Ser. No. 448,212
Term of patent 14 years
U.S. Cl. D21—145

278,452
TOY GUN
Paul B. Makhoulian, 27445 Hystone, Farmington Hills, Mich. 48018
Filed Dec. 9, 1982, Ser. No. 448,213
Term of patent 14 years
U.S. Cl. D21—145



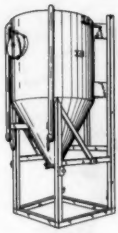
278,453
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 626,327
Term of patent 14 years
U.S. Cl. D21—190

278,454
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982, , which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, , which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979,. This application Jun. 29, 1984, Ser. No. 626,373
Term of patent 14 years
U.S. Cl. D21—190

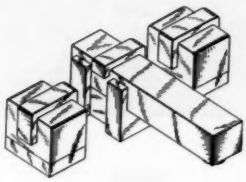
278,455
ARM WEIGHT OR SIMILAR ARTICLE
Robert J. Nosek, 469 Bouckhart Ave., Rochester, N.Y. 14622
Filed Aug. 1, 1983, Ser. No. 519,008
Term of patent 14 years
U.S. Cl. D21—196

278,456
GAME CARRYING STRAP ASSEMBLY HAVING PLURAL LOOP ENDED STRAPS
Frederick F. Lewis, 5029 Dryades St., New Orleans, La. 70115
Filed Feb. 17, 1983, Ser. No. 467,261
Term of patent 14 years
U.S. Cl. D22—13

278,457
TRANSPORTABLE BULK CONTAINER
Ernest W. Schroder, and David A. Pickford, both of Largs Bay, Australia, assignors to Adelaide Brighton Cement Limited, Australia
Filed Jun. 23, 1982, Ser. No. 391,239
Claims priority, application Australia, Dec. 24, 1981, 86138
Term of patent 14 years
U.S. Cl. D23—2



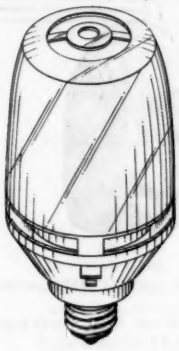
278,458
FAUCET SET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Long Island City, N.Y.
Filed May 3, 1983, Ser. No. 491,119
Term of patent 14 years
U.S. Cl. D23—25



278,459
SINK STRAINER
Ronald E. Cook, 4160 Echowoods Dr., Clarkston, Ga. 30021
Filed Sep. 30, 1982, Ser. No. 431,141
Term of patent 14 years
U.S. Cl. D23—42

278,460
PORTABLE FIRE DRAFT MAKER OR SIMILAR ARTICLE
Anthony Kimball, 8686½ Long Hill Rd., Rome, N.Y. 13440
Filed Aug. 30, 1982, Ser. No. 413,096
Term of patent 14 years
U.S. Cl. D23—90.1

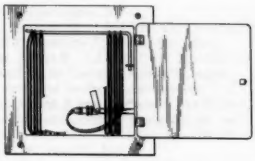
278,462
AIR-COOLED COMPACT ELECTRIC LAMP
Denis E. Bedel, Pittsburgh, Pa., assignor to North American Philips Electric Corp., New York, N.Y.
Filed Jul. 26, 1982, Ser. No. 402,193
Term of patent 14 years
U.S. Cl. D26—3



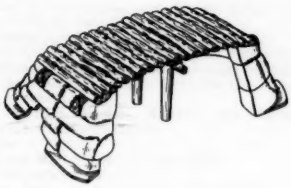
278,461
SUN LAMP
Lynford S. Pepall, Waskemeer, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 27, 1982, Ser. No. 453,325
Claims priority, application Benelux, Jul. 2, 1982, 56978-00
Term of patent 14 years
U.S. Cl. D24—68

278,463
FLUORESCENT LIGHT BALLAST RECEPTACLE WITH INTEGRAL WALL PLUG
Gary W. Vest, 4480 Broadview Rd., Cleveland, Ohio 44109
Filed Mar. 22, 1982, Ser. No. 360,229
Term of patent 14 years
U.S. Cl. D26—113

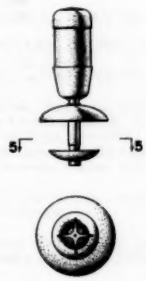
278,464
COMBINED FIRE HOSE AND CABINET THEREFOR
Robert Brooks, 2 Caldwell St., Weymouth, Mass. 02191
Filed Sep. 13, 1982, Ser. No. 416,964
Term of patent 14 years
U.S. Cl. D29—2



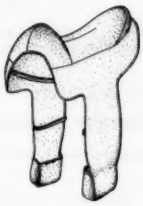
278,465
AQUARIUM ORNAMENT
Jerome Goldman, New York; Marvin Goldman, Great Neck; Gerald Philips, Glen Cove, and Joseph Pesin, Brooklyn, all of N.Y., assignors to Penn Plax Plastics, Garden City, N.Y.
Filed Jun. 2, 1983, Ser. No. 500,458
Term of patent 14 years
U.S. Cl. D30—12



278,466
BIRD FEEDER
Robert H. Springer, 3280 Observatory Ave., Cincinnati, Ohio 45208
Filed Feb. 4, 1983, Ser. No. 464,010
Term of patent 14 years
U.S. Cl. D30—15

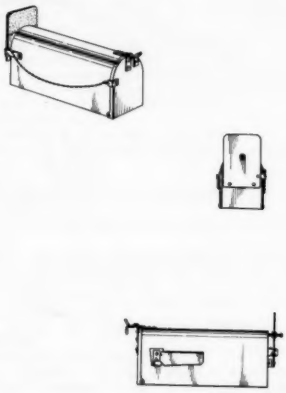


278,467
SADDLE COVER
Harry J. Lang, Rte. 1, Box 20, Heber, Utah 84032
Filed Nov. 29, 1982, Ser. No. 445,239
Term of patent 14 years
U.S. Cl. D30—19



278,468
PLASTIC SHEET MATERIAL OR THE LIKE
Helen H. Trotman, deceased, late of Virginia Beach, VA; by Peter M. Huber, legal representative, 1800 Virginia Natl. Bank Bldg., Norfolk, Va. 23510, and Herbert H. Trotman, P.O. Box 807, Virginia Beach, Va. 23451
Filed Jan. 4, 1982, Ser. No. 337,511
Term of patent 14 years
U.S. Cl. D92—1.1

278,469
COMBINED MAILBOX AND SIGNAL
Edward E. Ross, Rte. 5, Box 900, Warrensburg, Mo. 64093
Filed Nov. 30, 1982, Ser. No. 445,527
Term of patent 14 years
U.S. Cl. D99—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF APRIL, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. O. Smith Corporation: *See—*
Kozak, Norman M., 4,511,790, Cl. 219-486.000.

A. O. Smith Harvestore Products, Inc.: *See—*
Roberts, James R., 4,511,257, Cl. 366-262.000.

Abbas, Daniel C., to Eastman Kodak Company. Active electro-optical distance detection methods and devices. 4,511,248, Cl. 356-4.000.

Abbey, Kirk J.; and Kunz, Barbara L., to SCM Corporation. Cathodic electrocoating composition compounded with latex binder for enhanced gloss retention. 4,511,446, Cl. 204-181.00C.

Abdel-Fattah, Adnan M.: *See—*
Russell, Bruce A.; and Abdel-Fattah, Adnan M., 4,511,308, Cl. 415-191.000.

Aboud, Fred G. Safety closure and container. 4,511,049, Cl. 215-216.000.

Abrahams, Louis: *See—*
Hutchins, Burleigh M.; and Abrahams, Louis, 4,510,684, Cl. 29-703.000.

Absenger, Erich: *See—*
Hatz, Ernst; and Absenger, Erich, 4,510,897, Cl. 123-90.480.

Ackerman, Mitchell N.: *See—*
Brown, Jason W.; and Ackerman, Mitchell N., 4,511,272, Cl. 401-6.000.

Ackley, John B. Combination sling and therapy device. 4,510,928, Cl. 128-94.000.

Adam, Fritz G., to ITT Industries, Inc. Integrated voltage divider with selection circuit. 4,511,881, Cl. 340-347.0DA.

Adamek, Frank C.; Bonds, James V.; and Bridges, Charles D., to Gray Tool Company. Multiple tubing hanger tie back system and method. 4,511,002, Cl. 166-382.000.

Adams, Graham R.: *See—*
Dewan, Shashi B.; and Adams, Graham R., 4,511,956, Cl. 363-49.000.

Adams, Joseph S. Compression wave former. 4,510,748, Cl. 60-39.020.

Adams Rite Products, Inc.: *See—*
Ahad, Munir J., 4,510,779, Cl. 70-208.000.

Adler, Arno, to L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques. Apparatus for the storage and mechanical transfer of stock or matrix capacitors. 4,511,026, Cl. 198-469.000.

Adolphi, Heinrich: *See—*
Rieber, Norbert; Boehm, Heinrich; and Adolphi, Heinrich, 4,511,723, Cl. 548-376.000.

AE PLC: *See—*
Slee, Roger H., 4,510,895, Cl. 123-48.00B.

Aeroquip Corporation: *See—*
Fournier, Paul J. E., 4,511,152, Cl. 277-207.00A.

Agbomeirele, Patricia G.: *See—*
Kroupa, Loretta A.; and Agbomeirele, Patricia G., 4,511,620, Cl. 428-220.000.

Agency of Industrial Science & Technology: *See—*
Sakai, Takashi; Honda, Naojiro; and Yonezu, Ikuo, 4,510,759, Cl. 62-48.000.

Agnes, Giovanni: *See—*
Ribaldone, Giuseppe; Felicioli, Maria G.; Santini, Claudio; and Agnes, Giovanni, 4,511,718, Cl. 544-406.000.

Agrawal, Mahendra P.: *See—*
Caldwell, David; and Agrawal, Mahendra P., 4,511,987, Cl. 364-715.000.

Ahad, Munir J., to Adams Rite Products, Inc. Aircraft door lock actuating mechanism. 4,510,779, Cl. 70-208.000.

Aigo, Seiichiro. Information card. 4,511,796, Cl. 235-492.000.

Air Lane Systems Inc.: *See—*
Lem, Hans J., 4,511,030, Cl. 198-633.000.

AIR Ltd.: *See—*
May, Michael G., 4,511,806, Cl. 290-43.000.

Air Structures International: *See—*
Carpanzano, Carmine, 4,511,279, Cl. 403-266.000.

Akazawa, Takashi: *See—*
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,511,990, Cl. 364-748.000.

AKG Akustische u.Kino-Gerate Gesellschaft m.b.H.: *See—*
Fidi, Werner; and Nawrata, Gunter, 4,512,009, Cl. 369-170.000.

Akiike, Yukio: *See—*
Hayashi, Hideki; Ito, Yukio; Akiike, Yukio; and Kinoshita, Shigeo, 4,511,103, Cl. 242-186.000.

Akiyama, Susumu: *See—*
Ninomiya, Masakazu; Suda, Toshi; Omori, Norio; Akiyama, Susumu; and Fukaya, Hiroyasu, 4,510,910, Cl. 123-486.000.

Akiyama, Toru: *See—*
Kosaka, Minoru; and Akiyama, Toru, 4,512,002, Cl. 369-44.000.

Akse, James R.; and Long, Stanley A., to North American Philips Corporation. Copper metallization for dielectric materials. 4,511,601, Cl. 427-79.000.

Aktiebolaget Electrolux: *See—*
Soderstrom, Sigvard V., 4,511,117, Cl. 251-73.000.

Aktiobolaget SKF: *See—*
Lachonius, Leif, 4,511,031, Cl. 198-836.000.

Akutsu, Masao: *See—*
Tsukada, Takami; Akutsu, Masao; and Saito, Tadao, 4,511,418, Cl. 156-245.000.

Akzo N.V.: *See—*
de Kroon, Jan, 4,510,743, Cl. 57-260.000.

Alar Engineering Corporation: *See—*
White, Harold R., 4,511,468, Cl. 210-181.000.

Albertson, Robert V. Adjustable valve assembly. 4,511,119, Cl. 251-216.000.

Albini, Giovanni: *See—*
Ruscitti, Tomaso; Albini, Giovanni; Torretta, Roberto; and Incerti Baldi, Andrea, 4,511,064, Cl. 222-153.000.

Alco Foodservice Equipment Company: *See—*
Rodth, Joseph J., 4,510,969, Cl. 137-614.050.

Alcoa Deutschland GmbH: *See—*
Brandes, Carlos E.; and Spatz, Gunter, 4,511,053, Cl. 215-252.000.

Aldred, Alan C. G., to British Petroleum Company p.l.c., The. Blends of hardened extract with copolymers of olefin/alkyl acrylate. 4,511,689, Cl. 524-484.000.

Aleem, Mohd A.; Lobsinger, James L.; and Wefel, Jerry D., to Sundstrand Corporation. Method of refurbishing a high speed rotor. 4,510,679, Cl. 29-598.000.

Alexander, David C.; and Knifton, John F., to Texaco Inc. Process for hydroformylation of terminal olefins to predominantly linear aldehydes. 4,511,740, Cl. 568-454.000.

Alexander, Edward N.; and Smith, Richard, to West-Point Pepperell, Inc. Process for recovery of phosphate ore. 4,511,463, Cl. 209-166.000.

Alexis, Keith: *See—*
Alexis, Raoul H., Jr., 4,510,838, Cl. 84-422.00R.

Alexis, Raoul H., Jr., to Alexis, Keith. Cymbal stand with rotating head. 4,510,838, Cl. 84-422.00R.

Alfa-Laval AB: *See—*
Andersson, Kenneth L., 4,511,591, Cl. 426-603.000.

Allen, Gordon H., to Motorola, Inc. Switch circuit having improved switching characteristics. 4,511,809, Cl. 307-254.000.

Allen, Joseph L.: *See—*
Rotramel, George L.; Veilleux, Daniel P.; and Allen, Joseph L., 4,511,579, Cl. 314-490.000.

Allen Organ Company: *See—*
Markowitz, Jerome, 4,510,836, Cl. 84-1.260.

Alley, Philip J.; and Ireland, Thomas R., to Hallmark Findings, Inc. Hollow earring post. 4,510,772, Cl. 63-12.000.

Allied Corporation: *See—*
Casey, Gary L., 4,510,904, Cl. 123-339.000.
Chai, Bruce H.; Bailey, Dana S.; Vetelino, John F.; Lee, Donald L.; and Andle, Jeffrey C., 4,511,817, Cl. 310-313.00A.
Frommer, Jane E.; Elsenbaumer, Ronald L.; and Davidson, Douglass S., 4,511,494, Cl. 252-518.000.
Leach, Earl A., Jr., 4,511,840, Cl. 324-160.000.
Perara, Thomas E., 4,510,803, Cl. 73-178.00R.
Saprokhin, Alexander M.; Friedland, David J.; Baran, Richard M.; Kim, Jung T.; and McCurry, Lynn E., 4,511,440, Cl. 204-60.000.
Steer, John E., 4,510,753, Cl. 60-578.000.

Allis-Chalmers Corp.: *See—*
Fetter, Stephen M., 4,511,380, Cl. 55-355.000.

Alpern, Marvin, to Ethicon, Inc. Package for surgical instrument. 4,511,035, Cl. 206-363.000.

Alps Electric Co., Ltd.: *See—*
Fujii, Shosaku, 4,511,879, Cl. 338-174.000.

Alsthom-Atlantique: *See—*
Romier, Roger; and Betoliere, Jean-Pierre, 4,511,776, Cl. 200-148.00A.

Alt, Richard C.; and Pinter, Joseph, to International Business Machines Corporation. Disposable strip assembly and retention device for a line printer. 4,510,862, Cl. 101-93.140.

Alten, Kurt. Transfer bridge for ramps. 4,510,638, Cl. 14-71.700.

Altenschopfer, Theodor: *See—*
Pruhs, Horst; and Altenschopfer, Theodor, 4,511,487, Cl. 252-99.000.

Aluminum Company of America: *See—*
LaBarge, Robert L.; Horansky, Frank J.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,510,857, Cl. 100-53.000.

LaBarge, Robert L.; Pohlenz, Elmer E.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Scherf, Thomas W., 4,510,860, Cl. 100-49.000.

Phelps, Frankie E.; Boget, Paul J.; and Troup, Robert L., 4,511,666, Cl. 501-98.000.

ALZA Corporation: *See—*
Theeuwes, Felix, 4,511,351, Cl. 604-56.000.
Theeuwes, Felix; and Urquhart, John, 4,511,352, Cl. 604-56.000.
Theeuwes, Felix, 4,511,353, Cl. 604-85.000.

Amadio, Alex: *See—*
Johnson, Clifford B., Jr.; Johnson, Barbara; Amadio, Alex; and Amadio, Williane, 4,511,358, Cl. 604-327.000.

Amadio, Williane: *See—*
Johnson, Clifford B., Jr.; Johnson, Barbara; Amadio, Alex; and Amadio, Williane, 4,511,358, Cl. 604-327.000.

Amalgamated Sugar Company, The: *See—*
Schoenrock, Karlheinz W., 4,511,476, Cl. 210-678.000.

Amana Refrigeration, Inc.: *See—*
Bucksbaum, Arnold M.; and Simpson, James E., 4,511,779, Cl. 219-10.55E.

American Audiographics, Inc.: *See—*
May, Ronald J., 4,511,033, Cl. 206-216.000.

American Can Company: *See—*
Bowen, William E., 4,511,520, Cl. 264-22.000.
Kudert, Frederick G.; Latreille, Maurice G.; and Tennant, William A., 4,511,528, Cl. 264-328.800.

American Cyanamid Company: *See—*
Misselbrook, John, 4,511,395, Cl. 71-121.000.

American Engineering Group International, Inc.: *See—*
Stone, Carroll E.; and Seifert, William F. C., 4,511,545, Cl. 423-240.000.

American Hoechst Corporation: *See—*
Liu, Shuchen, 4,511,640, Cl. 430-157.000.

American Monitor Corporation: *See—*
Beaty, Larry E.; and Lanham, Steven M., 4,511,651, Cl. 435-15.000.

American Science and Engineering, Inc.: *See—*
Bjorkholm, Paul J., 4,511,799, Cl. 250-367.000.

American Sterilizer Company: *See—*
Linden, Harry A., 4,510,816, Cl. 74-372.000.

Ameron, Inc.: *See—*
Magarian, Gerald M.; and Friedrich, Ralph S., 4,511,423, Cl. 136-425.000.

AMF Incorporated: *See—*
Hou, Kenneth C., 4,511,473, Cl. 210-348.000.
Neville, Richard E. G., 4,510,808, Cl. 73-433.000.

Amfit Incorporated: *See—*
Phillips, Edward H., 4,510,636, Cl. 12-1.00R.

Amirante, Dominic, to Westinghouse Electric Corp. Programmable time registering AC electric energy meter having randomized load control. 4,511,979, Cl. 364-481.000.

Ammco Tools, Inc.: *See—*
Bogaerts, Leo C.; and Murphy, John W., 4,510,828, Cl. 82-4.00A.

Amos, Homer C.; Benedyk, Joseph C.; Scheie, Carl E.; and McGlove, William R., to Brunswick Corporation. Scoop and cup device for playing a game. 4,511,148, Cl. 273-326.000.

AMP Incorporated: *See—*
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,511,197, Cl. 339-17.0CF.

Ampex Corporation: *See—*
Fechner, Erno H., 4,511,943, Cl. 360-130.230.

Ampferer, Herbert, to Dr. Ing. h.c.f. Porsche AG. Reciprocating piston internal combustion engine, preferably of four-cylinder construction. 4,510,898, Cl. 123-192.00R.

Ampliform Pty. Ltd.: *See—*
Jury, Harold R., 4,510,727, Cl. 52-508.000.

Analog Devices, Incorporated: *See—*
Tuttle, Ralph C.; and Payne, Richard S., 4,511,413, Cl. 148-187.000.

Anand, Joginder N.; Revak, Timothy T.; and Rossini, Frank J., to Dow Chemical Company, The. High temperature battery cell comprising stress-free hollow fiber bundle. 4,510,681, Cl. 29-623.100.

Anantha, Narasipur G.; Gaur, Santosh P.; Huang, Yi-Shiou; and Tsang, Paul J., to International Business Machines, Corporation. Method of fabricating a lateral PNP transistor. 4,510,676, Cl. 29-577.00C.

Ancra Corporation: *See—*
Prete, Ernest, Jr.; and Knox, Howard, 4,510,651, Cl. 24-68.00R.

Anderson, George A., III: *See—*
Fraser, Howard H., Jr.; and Anderson, George A., III, 4,511,314, Cl. 417-363.000.

Anderson, Jeffrey L.; Ruhoff, Philip J.; and Edenborg, Robert B., to Valspar Corporation, The. Cationic electrodeposition composition. 4,511,692, Cl. 525-7.000.

Anderson, Richard N., to V. E. Anderson Mfg. Co. Window structure. 4,510,713, Cl. 49-175.000.

Andersson, Kenneth L., to Alfa-Laval AB. Spreadable fat product and method for its production. 4,511,591, Cl. 426-603.000.

Andle, Jeffrey C.: *See—*
Chai, Bruce H.; Bailey, Dana S.; Vetelino, John F.; Lee, Donald L.; and Andle, Jeffrey C., 4,511,817, Cl. 310-313.00A.

Andors, Derik K.: *See—*
Ferguson, Robert W.; Andors, Derik K.; and Crossman, William W., Jr., 4,510,918, Cl. 126-79.000.

Andow, Fumio; and Nakashima, Masuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Protective relaying system. 4,511,981, Cl. 364-492.000.

Andresen, Bernhard H., to Texas Instruments Incorporated. Gain switching amplifier. 4,511,234, Cl. 354-428.000.

Andrew Corporation: *See—*
Brooker, Eric L., 4,511,899, Cl. 343-784.000.

Anemaet, John M.: *See—*
Boyd, Mary G.; Smith, Donald R.; Imondi, Peter F.; Hiatt, Norman A.; Bauer, Fritz E.; Anemaet, John M.; and MacKenzie, Alfred K., 4,511,425, Cl. 156-493.000.

Anjier, Joseph L.; Roberson, Morris L.; and Atchison, William E., to Kaiser Aluminum & Chemical Corporation. Bayer process production of alumina hydrate. 4,511,542, Cl. 423-127.000.

Anonuma, Masashi; Tamai, Yasuo; Sato, Tsunehiko; Funabashi, Shinichi; and Ogawa, Hiroshi, to Fuji Photo Film Co. Process for preparing magnetic coating composition. 4,511,484, Cl. 252-62.540.

Anritsu Electric Company Limited: *See—*
Tanaka, Seiitch; and Inoue, Akitoshi, 4,511,448, Cl. 204-198.000.

Aoki, Ryuji: *See—*
Saito, Noboru; Satake, Takeshi; Aoki, Ryuji; and Nagai, Isao, 4,511,671, Cl. 502-242.000.

Aono, Shin: *See—*
Matsui, Fumio; Aono, Shin; Sakai, Hiroshi; Hattori, Katsuhide; and Kakino, Shigeru, 4,511,414, Cl. 149-109.600.

Aoyagi, Yukio: *See—*
Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,510,750, Cl. 60-443.000.

Aoyama, Keizo: *See—*
Sampei, Takeshi; Miyahara, Norio; Nikaido, Tadanobu; Sato, Hiroaki; and Aoyama, Keizo, 4,512,012, Cl. 370-66.000.

Arai, Naoto, to Kanzaki Paper Mfg. Co., Ltd. Heat-sensitive recording materials. 4,511,909, Cl. 346-208.000.

Arai, Tatsuo: *See—*
Shimomura, Hiroshi; and Arai, Tatsuo, 4,511,293, Cl. 407-41.000.

Arai, Tetsuji; and Mimura, Yoshiki, to Ushio Denki Kabushiki Kaisha. Light-radiant heating furnace. 4,511,788, Cl. 219-405.000.

Arano, Yasushi: *See—*
Yokoyama, Akira; Arano, Yasushi; and Hosotani, Takeo, 4,511,550, Cl. 424-1.100.

Arbed S.A.: *See—*
Weiner, Antoine, 4,511,397, Cl. 75-59.170.

Arcara, Samuel A., to Honeywell Inc. Fuel entrained oxygen compensation for calorific content analyzer. 4,511,262, Cl. 374-37.000.

Arconthorn Limited: *See—*
Moreuil, Rene , 4,511,580, Cl. 514-578.000.

Arens, Hans, to Grunbeck Wasseraufbereitung GmbH. Dosing appliance. 4,510,978, Cl. 141-65.000.

Arikawa, Hiroo, to S.O.C. Corporation. Micro-fuse assembly. 4,511,875, Cl. 337-201.000.

Arikawa, Junichi: *See—*
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,511,133, Cl. 271-3.100.

Ariyoshi, Takashi; Emura, Noriaki; and Sakanaka, Yasuhiro, to Toyo Soda Manufacturing Co., Ltd. Process for preparing a rubber-asphalt composition. 4,511,679, Cl. 521-83.000.

Armanet, Jean-Michel: *See—*
Tournier, Herve; Johansson, Allan A.; Sachetto, Jean-Pierre; Armanet, Jean-Michel; Michel, Jean-Pierre; and Roman, Alain, 4,511,433, Cl. 162-16.000.

Armstrong, Harold A. Baseball training bat. 4,511,139, Cl. 273-26.00B.

Arndt, Eric D.: *See—*
LaBarge, Robert L.; Horansky, Frank J.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,510,857, Cl. 100-53.000.
LaBarge, Robert L.; Pohlenz, Elmer E.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Scherf, Thomas W., 4,510,860, Cl. 100-49.000.

Arnim, Robert C., II; and Bourne, Gregory D., to Phillips Petroleum Company. Stacked open bottom temporary guide base for offshore drilling. 4,510,985, Cl. 175-7.000.

Arter, William L.; and Williams, Foster R., to Jetline Engineering, Inc. Seam tracker. 4,511,785, Cl. 219-124.340.

Arthur, Hugh M., to Molins, Ltd. Continuous rod manufacture. 4,511,420, Cl. 156-356.000.

Artz, Gerd; Figge, Dieter; and Philipp, Clemens, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Continuous casting apparatus with shrinkage compensation. 4,510,990, Cl. 164-431.000.

Arvidsson, Gunnar: *See—*
Thylen, Lars; Stensland, Leif; and Arvidsson, Gunnar, 4,511,206, Cl. 350-96.110.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,511,518, Cl. 260-543.00F.
Mitsumori, Masaru, 4,511,364, Cl. 44-51.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Hidaka, Tsuneo; Inoue, Masahide; and Ogiso, Makoto, 4,511,336, Cl. 433-173.000.
Komoto, Shinsuke, 4,511,221, Cl. 350-423.000.

Asahi-Matsu Foods Inc.: *See—*
Kudo, Shiro; and Hayashi, Mitsuyoshi, 4,511,588, Cl. 426-302.000.

Asahi, Sadaho, to Yoshida Kogyo K. K. Slide fastener assembly for case or folder. 4,510,655, Cl. 24-382.000.

ASARCO Incorporated: *See—*
Goffman, Martin; and Jordan, Thomas L., 4,511,443, Cl. 204-108.000.

Ashbee, William H.; Janssen, Donovan M.; Martin, Ronald J.; and Seaward, William S., to International Business Machines Corporation. Electronic alignment for a paper processing machine. 4,511,242, Cl. 355-14.00C.

Ashby, Benjamin F. Processing tank for making photographic contact prints. 4,511,231, Cl. 354-301.000.

Association pour la Recherche et le Developpemente des Methods et Processus Industrieles (Armines): *See*—
Collot, Jean, 4,510,987, Cl. 164-71.100.

AT&T Bell Laboratories: *See*—
Baker, Paul A.; and Strautz, Michael G., 4,511,201, Cl. 339-75.0MP.
Dombrowski, Leonard C., 4,511,859, Cl. 331-11.000.
Forrest, Stephen R.; Kaplan, Martin L.; Schmidt, Paul H.; and Venkatesan, Thirumalai N. C., 4,511,445, Cl. 204-158.0HE.
Greenstein, Lawrence J.; and Yeh, Yu S., 4,512,034, Cl. 455-139.000.
Nash, Randy D.; and Wong, Wai C., 4,512,013, Cl. 370-69.100.
Tsang, Won-Tien, 4,512,022, Cl. 372-45.000.
Turner, Jonathan S., 4,512,011, Cl. 370-60.000.

AT&T Information Systems: *See*—
Nici, Richard J.; Schramm, George W.; and Sharp, John B., 4,512,017, Cl. 370-110.100.

AT&T Information Systems Inc.: *See*—
Fulcomer, Emanuel J., Jr.; Nici, Richard J.; Poteat, Vance E.; Schramm, George W.; Sharp, John B.; and Winseck, Michael M., Jr., 4,512,016, Cl. 370-110.100.
Koenig, Mark J.; and Oye, Kevin J., 4,511,969, Cl. 364-200.000.

AT&T Technologies, Inc.: *See*—
Ors, Jose A.; and Small, Richard D., Jr., 4,511,757, Cl. 174-68.500.

Atago, Takeshi; and Manaka, Toshio, to Hitachi, Ltd. Electronic control system for controlling air-fuel ratio in an internal combustion engine. 4,510,907, Cl. 123-435.000.

Atchison, William E.: *See*—
Anjier, Joseph L.; Roberson, Morris L.; and Atchison, William E., 4,511,542, Cl. 423-127.000.

Ateliers et Chantiers de Bretagne, A C B: *See*—
Pierart, Robert, 4,511,532, Cl. 376-461.000.

Atkinson, Colin: *See*—
Lawrence, Christopher J.; Wilkinson, Philip M.; and Atkinson, Colin, 4,510,744, Cl. 57-280.000.

Atlantic Richfield Company: *See*—
Gaffney, Anne M., 4,511,754, Cl. 585-656.000.
Miller, Richard F.; and Nicholson, Michael P., 4,511,457, Cl. 208-48.0AA.

Atlas Copco Aktiebolag: *See*—
Herron, Lorne R., 4,511,289, Cl. 405-259.000.

Attig, T. G.; and Grasselli, R. K., to Standard Oil Company, The. Ammoxidation of methanol to produce hydrogen cyanide. 4,511,548, Cl. 423-376.000.

Attler, Anthony R. Dipstick guide device for automotive vehicles. 4,510,690, Cl. 33-126.70R.

Atwater, Richard G., to Firex Corporation. Surge protected smoke alarm. 4,511,889, Cl. 340-629.000.

Auerswald, David C. Method for regenerating water polishers using ammonium sulphate. 4,511,675, Cl. 521-26.000.

Aurora Mechatronics Corporation: *See*—
Kuo, Calven, 4,511,765, Cl. 179-90.0BD.

Australian Dairy Corporation: *See*—
Hammond, Leslie A.; and Freeman, Norman H., 4,510,856, Cl. 99-457.000.

Automated Container Corporation: *See*—
Zysset, Edgar H., 4,511,299, Cl. 413-12.000.

Avner, Correy B. Secondary grilling apparatus. 4,510,855, Cl. 99-450.000.

Awaya, Akira: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,511,574, Cl. 514-371.000.

Axelrod, Shimshon: *See*—
Keren, Yehuda; Carmon, Shmuel; Behar, Meyer; and Axelrod, Shimshon, 4,511,543, Cl. 423-167.000.

Axelsson, Carl-Lennart, to IPS Interproject Service AB. Carbon gasification method. 4,511,372, Cl. 48-197.00R.

Ayliffe, Peter J.: *See*—
Crossland, William A.; Ross, Peter W.; and Ayliffe, Peter J., 4,511,926, Cl. 358-236.000.

Ayroldi, Giuseppe. Apparatus for the recovery of oils or other similar substances floating on streaming water courses. 4,511,470, Cl. 210-242.300.

B. B. Robertson Company: *See*—
Robertson, Michael L., 4,510,854, Cl. 99-337.000.

B-Bar-B, Inc.: *See*—
Ellert, Roger H., 4,510,737, Cl. 53-570.000.

B. F. Goodrich Company, The: *See*—
Grider, Bruce A., 4,511,021, Cl. 188-218.0XL.
Yu, Simon H., 4,511,742, Cl. 568-614.000.

Babcock & Wilcox Company, The: *See*—
Keyes, Marion A., IV; and Thompson, William L., 4,511,882, Cl. 340-347.0DD.

Bachofen AG: *See*—
Kagi, Bruno, 4,510,845, Cl. 91-180.000.

Baier, Manfred; and Tobler, Andreas, to BBC Brown, Boveri & Company, Limited. Current transformer insulated by pressurized gas. 4,511,873, Cl. 336-90.000.

Bailey, Dana S.: *See*—
Chai, Bruce H.; Bailey, Dana S.; Vetelino, John F.; Lee, Donald L.; and Andle, Jeffrey C., 4,511,817, Cl. 310-313.00A.

Bailly, Jean C., to BP Chimie Societe Anonyme. Catalysts for the polymerization and copolymerization of propylene and polymerization processes using these catalysts. 4,511,703, Cl. 526-125.000.

Bair, Kenneth W., to Burroughs Wellcome Co. Phenanthrene derivatives. 4,511,582, Cl. 514-654.000.

Baker Oil Tools, Inc.: *See*—
Krause, William F., Jr.; and Hopmann, Mark E., 4,510,995, Cl. 166-217.000.

Baker, Paul A.; and Strautz, Michael G., to AT&T Bell Laboratories. Module mounting assembly. 4,511,201, Cl. 339-75.0MP.

Balaskas, Spyros, to Vereinigte Flugtechnische Werke GmbH. Hydraulic control valves. 4,510,973, Cl. 137-625.640.

Ball Corporation: *See*—
Greeson, Richard L.; and Geikas, George I., 4,511,614, Cl. 428-141.000.
Munson, Robert E.; and Haddad, Hussain A., 4,511,868, Cl. 333-257.000.
Olsen, Arthur A., 4,511,250, Cl. 356-225.000.

Ballik, Rainer; and Hutten, Heinrich, to Pierburg GmbH & Co., KG. Fuel-injection systems and associated methods. 4,511,082, Cl. 239-8.000.

Balogh, Albert: *See*—
Benko, Pal; Ratz nee Simonek, Ildiko ; Pallos, Laszlo ; Magyar, Karoly; Kovacs, Jeno ; Matrai, Erzsebet; Gundel, Janos; and Balogh, Albert, 4,511,717, Cl. 544-353.000.

Balogh, Karoly: *See*—
Mogyorodi, Ferenc; Koppany, Eniko; Bodi, Tibor; Balogh, Karoly; Toth, Istvan; Bognar, Rezso; Makleit, Sandor; Litkei, Gyorgy; Rakosi, Miklos; and Dinya, Zoltan, 4,511,736, Cl. 564-214.000.

Bando, Seiji: *See*—
Ebata, Sadao; and Bando, Seiji, 4,511,089, Cl. 239-553.300.

Bandoh, Kazuo. Apparatus for enclosing semiconductors with resin by molding. 4,511,317, Cl. 425-116.000.

Banks, Russell; and Magid, David J., to Enviro-Spray Systems Incorporated. Expandable bag and method of manufacture. 4,510,734, Cl. 53-449.000.

Bar-Ray Products, Inc.: *See*—
Pokrinchak, Jordan J., 4,510,708, Cl. 40-361.000.

Baran, Madelyn M.; and Bleile, Dennis M., to Bio-Rad Laboratories, Inc. Simultaneous assay for T and B lymphocyte populations and subpopulations. 4,511,662, Cl. 436-513.000.

Baran, Richard M.: *See*—
Saprokhin, Alexander M.; Friedland, David J.; Baran, Richard M.; Kim, Jung T.; and McCurry, Lynn E., 4,511,440, Cl. 204-60.000.

Bare, Thomas M.; and Heald, Anthony F., to ICI Americas Inc. CNS-Depressant pyrazolopyridines. 4,511,568, Cl. 514-293.000.

Barkhau, Marvin L.; and Kujawa, Joseph J., to Owens-Illinois, Inc. Forehearth for molten glass and method of using same. 4,511,385, Cl. 65-135.000.

Barkmeyer, Hans: *See*—
Hesse, Theodor; and Barkmeyer, Hans, 4,511,292, Cl. 406-152.000.

Barner, William H.: *See*—
Martin, Ernest N.; Barner, William H.; and Martin, Don M., 4,511,067, Cl. 222-230.000.

Baron, Kenneth: *See*—
Holstedt, Richard A.; Baron, Kenneth; and Jessup, Peter, 4,511,516, Cl. 260-462.00R.

Barraud, Andre ; and Leloup, Jean, to Commissariat a l'Energie Atomique. Process and apparatus for producing alternate monomolecular layers. 4,511,604, Cl. 427-402.000.

Barreras, Francisco J., to Cordis Corporation. P Wave detection system. 4,510,945, Cl. 128-696.000.

Barrington, Claud C.: *See*—
Jennings, Charles E.; Barrington, Claud C.; Chen, Lien-Yan; Hopkins, Bob C.; McIntyre, John N.; and Regitz, Alfred P., 4,510,960, Cl. 137-75.000.

Barsi, Endre: *See*—
Ingermann, Donald E.; Smith, Ronald L.; Knoll, Jimmie L.; Caffrey, Stephen F.; Barsi, Endre; and Dechant, Joseph C., 4,510,642, Cl. 15-231.000.

Barter, LeRoy D., to Beckman Instruments, Inc. Device for starting and operating gas discharge tubes. 4,511,195, Cl. 315-308.000.

Bartholet, Stephen J., to Odetics, Inc. Leg mechanism for walking machine. 4,511,011, Cl. 180-8.600.

Bartlett, Robert L.; and McKee, Robert N., to Shopsmith, Inc. Table assembly for a multipurpose tool. 4,510,980, Cl. 144-1.00C.

Barton, Delmar O.; and Simpson, Loran R., to Metromail Corporation. Phase controlled gripper operating system for collator. 4,511,130, Cl. 270-54.000.

Bartuska, Victor J.; Lewis, David H.; Lewis, Robin B.; and Dalbow, David G., to Chemagnetics, Inc. Method and apparatus for high speed magic angle spinning. 4,511,841, Cl. 324-321.000.

BASF Aktiengesellschaft: *See*—
Baumann, Hans; and Kaack, Hermann, 4,511,506, Cl. 534-631.000.
Hagen, Helmut; Markert, Juergen; Kohler, Rolf-Dieter; and Wuerzer, Bruno, 4,511,393, Cl. 71-92.000.
Mahnke, Harald; Woerner, Frank P.; Weber, Heinz; and Kreibiehl, Guenter, 4,511,678, Cl. 521-52.000.
Nissen, Axel; Horner, Michael; Horn, Dieter; Lueddecke, Erik; and Teege, Gernot, 4,511,685, Cl. 524-110.000.
Rieber, Norbert; Boehm, Heinrich; and Adolphi, Heinrich, 4,511,723, Cl. 548-376.000.
Sauer, Wolfgang; and Hoffmann, Wolfgang, 4,511,739, Cl. 568-473.000.

BASF Wyandotte Corporation: *See*—
Schmolka, Irving R., 4,511,563, Cl. 514-162.000.

Bastida, Ezio M.; and Bergamini, Paolo, to CISE Centro Informazioni Studi Esperienze S.p.A. Planar microwave oscillator mounted on a dielectric cavity. 4,511,860, Cl. 331-96.000.

Bateson, Paul F.: *See*—
Drake, Cyril F.; Jones, Ronald; Bateson, Paul F.; Grant, Ronald J.; and Burrage, Martin E., 4,511,404, Cl. 106-14.120.

Batra, Subhash K. Suture. 4,510,934, Cl. 128-335.500.

Battelle Memorial Institute: *See*—
Tournier, Herve; Johansson, Allan A.; Sachetto, Jean-Pierre; Armanet, Jean-Michel; Michel, Jean-Pierre; and Roman, Alain, 4,511,433, Cl. 162-16.000.

Bauer, Fritz E.: *See*—
Boyd, Mary G.; Smith, Donald R.; Imondi, Peter F.; Hiatt, Norman A.; Bauer, Fritz E.; Anemaet, John M.; and MacKenzie, Alfred K., 4,511,425, Cl. 156-493.000.

Bauer, Marshall, to Nation Enterprises, Inc. Dough forming molding assembly. 4,511,324, Cl. 425-398.000.

Bauer, Michael T., to National Viewtech Corp. Liquid coupling system for video projectors. 4,511,927, Cl. 358-250.000.

Bauer, Wilhelm: *See*—
Klein, Wilhelm; Koske, Jorg; Herzog, Siegfried; Jordan, Hans-Peter; Bauer, Wilhelm; Bausch, Max; and Grabner, Christian, 4,511,214, Cl. 350-632.000.

Bauer, Wolfgang; and Grosser, Werner, to Karl Schmidt GmbH. Device for making a firm, but releasable joint between a steering wheel and a locking bolt. 4,510,821, Cl. 74-552.000.

Baumann, Hans; and Kaack, Hermann, to BASF Aktiengesellschaft. Reactive bis-triazinyl stilbene dyes. 4,511,506, Cl. 534-631.000.

Baumeister, Hans P., to Eastman Kodak Company. Corona generating apparatus and method. 4,511,244, Cl. 355-14.0FU.

Baumers, Johannes; Lisken, Werner; and Lietzke, Heinz, to Losenhausen Maschinenbau AG. Flyweight vibrator designed as directional vibrator. 4,510,815, Cl. 74-61.000.

Baumert, Kenneth L.; Sagues, Alberto A.; and Davis, Burtron H., to International Coal Refining Company. Corrosion inhibition when distilling coal liquids by adding cresols or phenols. 4,511,453, Cl. 208-8.0LE.

Baumert, Kenneth L.; Sagues, Alberto A.; and Davis, Burtron H., to International Coal Refining Company. Minimizing corrosion in coal liquid distillation. 4,511,460, Cl. 208-348.000.

Bausch, Max: *See*—
Klein, Wilhelm; Koske, Jorg; Herzog, Siegfried; Jordan, Hans-Peter; Bauer, Wilhelm; Bausch, Max; and Grabner, Christian, 4,511,214, Cl. 350-632.000.

Baxter, Kenneth D.: *See*—
Espiritu Santo, Eugenio; Baxter, Kenneth D.; and Bluem, Gary R., 4,510,814, Cl. 73-862.570.

Baxter Travenol Laboratories, Inc.: *See*—
Fowles, Thomas A.; Slater, Glenn L.; and Winchell, David A., 4,511,529, Cl. 264-515.000.

Bayer Aktiengesellschaft: *See*—
Krimm, Heinrich; Buysch, Hans-Josef; Lange, Peter M.; and Klipper, Reinhold, 4,511,722, Cl. 548-231.000.
Kruger, Bernd-Wieland; and Behrenz, Wolfgang, 4,511,562, Cl. 514-112.000.
Lindner, Christian; Braese, Hans-Eberhard; Ott, Karl-Heinz; and Uerdingen, Walter, 4,511,695, Cl. 525-80.000.
Niederdellmann, Georg; and Grigat, Ernst, 4,511,680, Cl. 521-49.500.
Schauf, Dieter; Protoschill, Klaus; Oberbach, Karl; and Depcik, Hans-Werner, 4,511,184, Cl. 301-63.0PW.

Bayerische Motoren Werke AG: *See*—
Klaus, Gersmann, 4,511,180, Cl. 297-408.000.
Schweiger, Erwin; Starmuehler, Erwin; and Temmesfeld, Axel, 4,510,893, Cl. 123-41.020.

BBC Brown, Boveri & Company, Limited: *See*—
Baier, Manfred; and Tobler, Andreas, 4,511,873, Cl. 336-90.000.
Bulaty, Paul; De Mesmaeker, Ivan; Franc, Zdenek; and Salerno, Giuseppe, 4,511,839, Cl. 324-127.000.
Korner, Gerhard; Plettner, Horst; Viering, Walter; and Rees, Volker, 4,511,775, Cl. 200-148.00A.

BBC Brown Boveri, Inc.: *See*—
Hochstrasser, Otto; Heine, Hans G.; and Buechi, Heinz, 4,511,125, Cl. 266-135.000.

Beasley, Gary; and Spector, George. Microwave clothes dryer. 4,510,697, Cl. 34-1.000.

Beaty, Larry E.; and Lanham, Steven M., to American Monitor Corporation. Reagent composition and assay for the determination of γ-glutamyltransferase activity. 4,511,651, Cl. 435-15.000.

Beckman Instruments, Inc.: *See*—
Barter, LeRoy D., 4,511,195, Cl. 315-308.000.
Nielsen, Steven T.; and Lee, Carleton C., 4,511,349, Cl. 494-16.000.

Behar, Meyer: *See*—
Keren, Yehuda; Carmon, Shmuel; Behar, Meyer; and Axelrod, Shimshon, 4,511,543, Cl. 423-167.000.

Behrenz, Wolfgang: *See*—
Kruger, Bernd-Wieland; and Behrenz, Wolfgang, 4,511,562, Cl. 514-112.000.

Bell, Robert K., to General Electric Company. VCO Having field effect and bipolar transistors in parallel. 4,511,861, Cl. 331-108.00R.

Bellar, Robert J.; Golden, William G.; Saperstein, David D.; and Vats, Ashok, to International Business Machines. Method and apparatus for simultaneously recording multiple FT-IR signals. 4,511,986, Cl. 364-576.000.

Beloit Corporation: *See*—
Berry, Kenneth W., 4,510,859, Cl. 100-35.000.
Ely, Donald A., 4,510,698, Cl. 34-117.000.

Belokin, Paul, Jr. Electrical connector having handle-mounted bifurcated resilient pin-engaging electrical plate. 4,511,200, Cl. 339-50.00R.

Ben Clements & Sons, Inc.: *See*—
Furutsu, Akira, 4,511,073, Cl. 227-67.000.

Bendix Corporation, The: *See*—
Gaiser, Robert F., 4,510,752, Cl. 60-562.000.

Benedyk, Joseph C.: *See*—
Amos, Homer C.; Benedyk, Joseph C.; Scheie, Carl E.; and McGlove, William R., 4,511,148, Cl. 273-326.000.

Benincasa, Timothy C.: *See*—
Snyder, Daniel S.; and Benincasa, Timothy C., 4,511,869, Cl. 334-20.000.

Benjamin, James A.; and Schutten, Herman P., to Eaton Corporation. Piezoelectric generator driven by a combustion engine. 4,511,818, Cl. 310-338.000.

Benkendorfer, Kyle B.: *See*—
Wang, Chun S.; Benkendorfer, Kyle B.; and Burba, John L., III, 4,511,710, Cl. 528-485.000.

Benko, Pal; Ratz nee Simonek, Ildiko; Pallos, Laszlo; Magyar, Karoly; Kovacs, Jeno; Matrai, Erzsebet; Gundel, Janos; and Balogh, Albert, to Egyt Gyogyszervegyeszeti Gyar. 2-Hydroxymethyl-quinoxaline-1,4-dioxide derivatives, a process for preparing same and compositions containing same. 4,511,717, Cl. 544-353.000.

Benmussa, Simon. Self heating receptacle. 4,510,919, Cl. 126-263.000.

Bennett, John T.: *See*—
Bennett, John T., Jr.; and Goodman, Jack E., 4,511,534, Cl. 422-100.000.

Bennett, John T., Jr.; and Goodman, Jack E., to Bennett, John T. Liquid transfer device. 4,511,534, Cl. 422-100.000.

Benning, Jack G., Jr.: *See*—
Maltby, Frederick L.; Loewenstern, Kenneth M.; and Benning, Jack G., Jr., 4,511,948, Cl. 361-280.000.

Berchem, Rutger, to Berchem & Schaberg GmbH. Cutting-tooth anchor for suction dredge and method of making same. 4,510,706, Cl. 37-64.000.

Berchem & Schaberg GmbH: *See*—
Berchem, Rutger, 4,510,706, Cl. 37-64.000.

Bergamini, Paolo: *See*—
Bastida, Ezio M.; and Bergamini, Paolo, 4,511,860, Cl. 331-96.000.

Bergman, Robert G.; Janowicz, Andrew H.; and Periana-Pillai, Roy A., to United States of America, Energy. Process for functionalizing alkanes. 4,511,745, Cl. 570-241.000.

Bergman, Roger W., to Dow Chemical Company, The. 1,3-Oxathiolane-2-thiones as sulfide mineral collectors in froth flotation. 4,511,464, Cl. 209-166.000.

Beringer Co., Inc.: *See*—
Trott, Delano B., 4,511,472, Cl. 210-340.000.

Berndt, Dieter R., to TRP Energy Sensors, Inc. Temperature-responsive pacifier assembly. 4,511,265, Cl. 374-151.000.

Berner, Godwin, to Ciba-Geigy Corporation. Process for the electron beam curing of coating compositions. 4,511,596, Cl. 427-44.000.

Bernhardt, Terry L., to U.S. Currency Protection Corp. Dual signal electromagnetic article theft detector. 4,511,888, Cl. 340-571.000.

Bernuchon, Marc; Pompei, Michel; and Gregoire, Daniel, to Hutchinson. Hydraulic membrane shock absorbers. 4,511,126, Cl. 267-140.100.

Berry, Kenneth W., to Beloit Corporation. Supercalender NIP relieving arrangement. 4,510,859, Cl. 100-35.000.

BERTIN & Cie: *See*—
Boy-Marcotte, Jean-Louis; Dahan, Gilbert M. I.; Dancette, Michel; Le Nabour, Marcel P.; Pellerin, Jean-Francois G. A.; Rivallin, Jose; and Jannot, Marcel A. J., 4,511,805, Cl. 290-2.000.

Bethlehem Steel Corporation: *See*—
Tatham, Edward J.; Kravits, Richard; Clymer, John C.; and Hoffman, Carvel D., 4,511,801, Cl. 250-394.000.

Betoliere, Jean-Pierre: *See*—
Romier, Roger; and Betoliere, Jean-Pierre, 4,511,776, Cl. 200-148.00A.

Betts, Alan J., to International Business Machines. Magnetizable recording disk and disk file employing servo sector head positioning. 4,511,938, Cl. 360-77.000.

Betz Laboratories, Inc.: *See*—
Reichgott, David W.; and Leary, Michael J., 4,511,676, Cl. 521-26.000.

BeVier, William E., to Union Carbide Corporation. Process and apparatus for direct heat transfer temperature swing regeneration. 4,511,375, Cl. 55-28.000.

Bhatti, Mohinder S., to Owens-Corning Fiberglas Corporation. Method for producing glass fiber. 4,511,383, Cl. 65-6.000.

Bierman, Laurence W.; Polinsky, Samuel M.; Hempel, David A.; and Humberger, Roger B., to J. R. Simplot Company. Process for the recovery of cadmium and other metals from solution. 4,511,541, Cl. 423-100.000.

Biftu, Tesfaye: *See*—
Chang, Michael N.; and Biftu, Tesfaye, 4,511,724, Cl. 548-452.000.

Biller, Sven-Olov, to KOCKUMS Industri AB. Self-centering feeding device. 4,510,981, Cl. 144-246.00F.

Billon, Alain; Jacquin, Yves; Peries, Jean-Pierre; and Toulhoat, Herve, to Institut Francais du Petrole. Heavy oil process with hydrodemetallation, hydrovisbreaking and hydrodesulfuration. 4,511,458, Cl. 208-59.000.

Bindl, Max; and Reusch, Heinz. Liquid boiler, particularly utility-water boiler. 4,510,891, Cl. 122-32.000.

Binz, Reiner; and Pointner, Norbert, to Siemens Aktiengesellschaft. Time slot multiplex system for the division multiplexing of digital communication signals. 4,512,014, Cl. 370-84.000.

Bio-Rad Laboratories, Inc.: *See*—
Baran, Madelyn M.; and Bleile, Dennis M., 4,511,662, Cl. 436-513.000.

Biosonics, Inc.: *See*—
Brenman, Henry S.; Katz, Philip; and Singer, Mark, 4,510,939, Cl. 128-639.000.

Bird, Graham J.: *See*—
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; and Farquharson, Graeme J., 4,511,391, Cl. 71-88.000.

Bird, Peter H.: *See*—
Mao, Raymond L. V.; and Bird, Peter H., 4,511,667, Cl. 502-64.000.

Biren, Marvin A., to Charles Stark Draper Laboratory, Inc., The. Inspection periscope. 4,511,222, Cl. 350-441.000.

Birnbaum, David H. Skate wheel cover. 4,511,182, Cl. 301-37.00P.

Bittler, Dieter: *See*—
Laurent, Henry; Nickisch, Klaus; Bittler, Dieter; Wiechert, Rudolf; and Losert, Wolfgang, 4,511,565, Cl. 514-173.000.

Bixby, James A., to Eastman Kodak Company. Slow motion using longitudinal recording and forward/reverse tape transportation. 4,511,931, Cl. 360-10.300.

Bjorkholm, Paul J., to American Science and Engineering, Inc. Dual energy imaging. 4,511,799, Cl. 250-367.000.

Blaak, Cornelis; and van Mondfrans, Gerardus H., to Stork Brabant B.V. System adapted to distribute a viscous substance. 4,510,863, Cl. 101-119.000.

Blanshine, Allison W.: *See*—
Campbell, Willis R.; and Blanshine, Allison W., 4,510,861, Cl. 100-88.000.

Blaskowski, Henry J., to Combustion Engineering, Inc. Method for preventing plugging of a slag outlet in a substoichiometric slagging combustor. 4,511,371, Cl. 48-197.00R.

Blaum, Franz, to Gebruder Kommerling Kunststoffwerke GmbH. Arrangement for stamping outer surface of shaped bar material. 4,511,323, Cl. 425-385.000.

Blechman, Abraham: *See*—
Smiley, Harry; and Blechman, Abraham, 4,511,330, Cl. 433-18.000.

Bleile, Dennis M.: *See*—
Baran, Madelyn M.; and Bleile, Dennis M., 4,511,662, Cl. 436-513.000.

Bloch, Igal: *See*—
Schour, Avi; and Bloch, Igal, 4,510,701, Cl. 36-68.000.

Blounts, Joseph: *See*—
Krause, Glenn C.; and Blounts, Joseph, 4,511,063, Cl. 222-75.000.

Bloxham, Roger W. Floating dry dock. 4,510,877, Cl. 114-45.000.

Bluem, Gary R.: *See*—
Espiritu Santo, Eugenio; Baxter, Kenneth D.; and Bluem, Gary R., 4,510,814, Cl. 73-862.570.

Board of Regents, The University of Texas System: *See*—
Luduena, Richard F., 4,511,501, Cl. 260-112.00R.

Bodi, Tibor: *See*—
Mogyorodi, Ferenc; Koppany, Eniko; Bodi, Tibor; Balogh, Karoly; Toth, Istvan; Bognar, Rezso; Makleit, Sandor; Litkei, Gyorgy; Rakosi, Miklos; and Dinya, Zoltan, 4,511,736, Cl. 564-214.000.

Bodig, Bernd; Hohne, Gerd; and Schmied, Helmut, to Robert Bosch GmbH. Monitoring circuit for resetting malfunctioning electronic components, such as microprocessors. 4,512,019, Cl. 371-12.000.

Boehm, Heinrich: *See*—
Rieber, Norbert; Boehm, Heinrich; and Adolphi, Heinrich, 4,511,723, Cl. 548-376.000.

Boeing Company, The: *See*—
Kasper, James R.; and Opsahl, Allan W., 4,510,714, Cl. 49-249.000.

Boesig, Werner; and Pritzwald-Stegmann, Bernd, to Meggle Milchindustrie GmbH & Co. KG. Coating process and agent for carrying out the process. 4,511,553, Cl. 424-35.000.

Bogaerts, Leo C.; and Murphy, John W., to Ammco Tools, Inc. Lathe cross feed assembly. 4,510,828, Cl. 82-4.00A.

Boger, Manfred; Ehrenfreund, Josef; Martin, Pierre; and Steiner, Eginhard, to Ciba Geigy Corporation. N-(2-Pyridyloxyphenyl)-N'-benzoyl ureas, pesticidal compositions containing same and pesticidal methods of use. 4,511,571, Cl. 514-351.000.

Boget, Paul J.: *See*—
Phelps, Frankie E.; Boget, Paul J.; and Troup, Robert L., 4,511,666, Cl. 501-98.000.

Bogin, Roger M.: *See*—
Serev, Peter G.; and Bogin, Roger M., 4,511,884, Cl. 340-347.0SY.

Bognar, Rezso: *See*—
Mogyorodi, Ferenc; Koppany, Eniko; Bodi, Tibor; Balogh, Karoly; Toth, Istvan; Bognar, Rezso; Makleit, Sandor; Litkei, Gyorgy; Rakosi, Miklos; and Dinya, Zoltan, 4,511,736, Cl. 564-214.000.

Bohmer, Christian, to Triumph-Adler A.G. fur Buro- und Informationstechnik. Apparatus for lifting print and correction ribbons in typewriters or like machines. 4,511,270, Cl. 400-214.000.

Bolam, Charles W.: *See*—
Conley, Richard W.; Tremblay, Richard P.; Bolam, Charles W.; Logan, James E.; and Krueger, David A., 4,511,120, Cl. 251-288.000.

Boland, Aloysius T. M.: *See*—
Span, Francis J.; Boland, Aloysius T. M.; and van Laarhoven, Albertus J. A. J., 4,511,275, Cl. 403-33.000.

Bonds, James V.: *See*—
Adamek, Frank C.; Bonds, James V.; and Bridges, Charles D., 4,511,002, Cl. 166-382.000.

Bonhomme, Jean: *See*—
Crussard, Charles; Maurel, Pierre; and Bonhomme, Jean, 4,511,540, Cl. 423-26.000.

Bonneau, Marc: *See*—
Play, Dominique; Bonneau, Marc; Merieux, Charles; Herbage, Daniel; and Comte, Philippe, 4,511,653, Cl. 435-69.000.

Bonny, Alan, to Standard Oil Company, The. Process for use of novel boride catalyst. 4,511,454, Cl. 208-10.000.

Bordoni, Maurice E.; and Lieberman, Ephraim. Disposable radioactive aerosol inhalation apparatus. 4,510,929, Cl. 128-200.140.

Borg-Warner Chemicals, Inc.: *See*—
Hechenbleikner, Ingenuin; and Enlow, William P., 4,511,725, Cl. 548-530.000.

Borg-Warner Corporation: *See*—
Mott, Philip J.; and Gallaher, Kenneth R., 4,510,962, Cl. 137-102.000.
Studtmann, George H., 4,511,834, Cl. 318-700.000.
Studtmann, George H., 4,511,835, Cl. 318-700.000.
Wiese, Winfred J., 4,511,149, Cl. 277-3.000.

Borgeaud, Roger: *See*—
Padly, Yvan; and Borgeaud, Roger, 4,511,589, Cl. 426-521.000.

Bosch, Erhard: *See*—
Kreuzer, Franz-Heinrich; Glauberman, Gisela; and Bosch, Erhard, 4,511,728, Cl. 556-419.000.

Bossina, Jaap, to Gap Gesselschaft fuer Auswertungen und Patente AG. Dispenser for paste-like products. 4,511,068, Cl. 222-257.000.

Boudreau, Daniel A., to Honeywell Information Systems Inc. Data processing system auto address development logic for multiword fetch. 4,511,960, Cl. 364-200.000.

Bourne, Gregory D.: *See*—
Arnim, Robert C., II; and Bourne, Gregory D., 4,510,985, Cl. 175-7.000.

Bowden, Edgar A.; Deline, Gordon R.; and Koeijmans, Gerard D., to Mobil Oil Corporation. Gun shot control unit for seismic exploration. 4,511,999, Cl. 367-23.000.

Bowditch, Philip N., to Charles Stark Draper Laboratory, Inc., The. Flat plane seam garment and method of making. 4,510,626, Cl. 2-115.000.

Bowen, William E., to American Can Company. Method of making perforated films. 4,511,520, Cl. 264-22.000.

Bowers, John E.: *See*—
Newton, Steven A.; and Bowers, John E., 4,511,207, Cl. 350-96.150.

Boy-Marcotte, Jean-Louis; Dahan, Gilbert M. I.; Dancette, Michel; Le Nabour, Marcel P.; Pellerin, Jean-Francois G. A.; Rivallin, Jose; and Jannot, Marcel A. J., to BERTIN & Cie. Convertor for thermal energy into electrical energy using Stirling motor and integral electrical generator. 4,511,805, Cl. 290-2.000.

Boyce, William A., to Macaster Controls, Inc. Vehicle alignment apparatus and methods. 4,510,694, Cl. 33-203.180.

Boyd, Mary G.; Smith, Donald R.; Imondi, Peter F.; Hiatt, Norman A.; Bauer, Fritz E.; Anemaet, John M.; and MacKenzie, Alfred K., to Dennison Manufacturing Company. Heated pad decorator. 4,511,425, Cl. 156-493.000.

BP Chimie Societe Anonyme: *See*—
Bailly, Jean C., 4,511,703, Cl. 526-125.000.

Bradburn, Marvin D.: *See*—
Woods, Richard E.; and Bradburn, Marvin D., 4,510,858, Cl. 100-35.000.

Braese, Hans-Eberhard: *See*—
Lindner, Christian; Braese, Hans-Eberhard; Ott, Karl-Heinz; and Uerdingen, Walter, 4,511,695, Cl. 525-80.000.

Brake, Werner: *See*—
Diemer, Peter; Brake, Werner; and Dittmer, Rainer, 4,511,549, Cl. 423-574.00R.

Brandenstein, Manfred: *See*—
Hans, Rudiger; and Brandenstein, Manfred, 4,511,192, Cl. 384-543.000.

Brandes, Carlos E.; and Spatz, Gunter, to Alcoa Deutschland GmbH. Lid for a container neck provided with a thread or undercut shoulder. 4,511,053, Cl. 215-252.000.

Brandolf, Henry E., to Multi-Arc Vacuum Systems Inc. Vapor deposition apparatus and method. 4,511,593, Cl. 427-37.000.

Braun Aktiengesellschaft: *See*—
Roth, Johann, 4,511,076, Cl. 228-180.100.

Brdr. Schur International A/S: *See*—
Hansen, Erik; and Lambach, Heinrich W., 4,510,733, Cl. 53-434.000.

Breedlove, James W. Volume-adjustable divers lift bag. 4,510,878, Cl. 114-54.000.

Brendes, Horst: *See*—
Pokorny, Cornel; and Brendes, Horst, 4,511,267, Cl. 400-110.000.

Brenman, Henry S.; Katz, Philip; and Singer, Mark, to Biosonics, Inc. Means for transferring electrical energy to and from living tissue. 4,510,939, Cl. 128-639.000.

Brennan, Edward J., to PTC Aerospace Inc. Quick release mounting for seat back tray table. 4,511,178, Cl. 297-146.000.

Bresson, Clarence R. Ore flotation with combined collectors. 4,511,465, Cl. 209-166.000.

Brice, Jean-Michel, to Societe pour l'Etude et la Fabrication de Circuits. Non-volatile decade counter using Johnson code or equivalent. 4,512,029, Cl. 377-33.000.

Bridges, Charles D.: *See—*
Adamek, Frank C.; Bonds, James V.; and Bridges, Charles D., 4,511,002, Cl. 166-382.000.

Bridgestone Tire Company Limited: *See—*
Ohkuni, Shinichiro; and Kitazawa, Yoichi, 4,510,983, Cl. 152-361.00R.
Tanuma, Itsuo; Takeichi, Hideo; Fukuura, Yukio; Ohyachi, Tomio; and Naito, Kazuo, 4,511,627, Cl. 428-429.000.

Brieger, Emmet F.: *See—*
George, Flint R.; and Brieger, Emmet F., 4,510,999, Cl. 166-297.000.

Brinkman, Richard J., to Dyson Refractories Limited. Electrodes for glass furnaces. 4,512,023, Cl. 373-36.000.

Bristol-Myers Company: *See—*
Geria, Navin; and Shin, Chung T., 4,511,554, Cl. 424-65.000.

British American Bank Note Inc.: *See—*
Small, Edward A., 4,511,908, Cl. 346-206.000.

British Petroleum Company p.l.c., The: *See—*
Aldred, Alan C. G., 4,511,689, Cl. 524-484.000.

Broan Mfg. Co., Inc.: *See—*
Sarnosky, Joseph R.; Wolbrink, David W.; and Otte, Dieter W., 4,510,851, Cl. 98-42.080.

Broken Hill Proprietary Company Limited, The: *See—*
Wilson, Peter K., 4,511,081, Cl. 238-59.000.

Brombal, David S.: *See—*
Bunner, Charles B. D.; and Brombal, David S., 4,511,950, Cl. 361-413.000.

Bromme, Irmfried; Brunner, Reinhold; and Reimer, Heinz, to Siemens Aktiengesellschaft. Arrangement for reading out defined data from a digital switching device with mutually asynchronous control signals for sequential switching of the device and transfer of the data. 4,511,993, Cl. 364-900.000.

Bronstein, Allen I. Solar reflector. 4,510,923, Cl. 126-438.000.

Brooker, Eric L., to Andrew Corporation. Horn-reflector microwave antenna with internal debris trap. 4,511,899, Cl. 343-784.000.

Brooks, William E., Jr.: *See—*
Schier, John H., Jr.; and Brooks, William E., Jr., 4,511,871, Cl. 335-213.000.

Brown, Dennis N. Variably adjustable shoe inserts. 4,510,700, Cl. 36-44.000.

Brown, James S.: *See—*
Gartmann, Russell J.; and Brown, James S., 4,510,755, Cl. 60-657.000.

Brown, Jason W.; and Ackerman, Mitchell N., to Brown, Jason W. Writing prosthesis. 4,511,272, Cl. 401-6.000.

Brown, Sam J., to Sam J. Brown Land & Cattle Company, Inc. Centerline sight with reverse pendulum. 4,511,005, Cl. 172-430.000.

Broyles, Robert K., to Pathway Bellows, Inc. Leak indicating conduit. 4,511,162, Cl. 285-93.000.

Brunner, Paul; and Hofer, Beat, to Vereinigte Drahtwerke AG. Method of forming a hard surface layer on a metal component. 4,511,411, Cl. 148-20.300.

Brunner, Reinhold: *See—*
Bromme, Irmfried; Brunner, Reinhold; and Reimer, Heinz, 4,511,993, Cl. 364-900.000.

Bruno, Graziella, to Media Research s.r.l. Derivatives of benzoic acid. 4,511,577, Cl. 514-448.000.

Bruno, Roberto; and Memmi, Massimo, to Zincroksid S.p.A. Galvanized steel sheet protected by chromium and chromium oxide layers. 4,511,633, Cl. 428-666.000.

Brunson, David T., to Dresser Industries, Inc. Rotary cutter drill bit with permanent snap ring cutter retention. 4,511,008, Cl. 175-369.000.

Brunswick Corporation: *See—*
Amos, Homer C.; Benedyk, Joseph C.; Scheie, Carl E.; and McGlove, William R., 4,511,148, Cl. 273-326.000.

Bucek, David C. Decorative fly-swatting device. 4,510,711, Cl. 43-137.000.

Bucha, Robert M.; Dzermejko, Albert J.; and Stuart, James G., to Raymond Kaiser Engineers Inc. Gas temperature monitoring device. 4,511,264, Cl. 374-135.000.

Buchner, Norbert; and Vogele, Gunther, to Robert Bosch GmbH. Apparatus for sterilizing packaging containers. 4,511,538, Cl. 422-303.000.

Bucksbaum, Arnold M.; and Simpson, James E., to Amana Refrigeration, Inc. Microwave oven shelf. 4,511,779, Cl. 219-10.55E.

Budai, Zoltan; Kis-Tamas, Attila; Mezei, Tibor; Lay, Aranka; Vigh, Zoltan; and Sokorai, Agnes, to EGYT Gyogyszervegyeszeti Gyar. Bicyclo(2.2.1)heptane oximes. 4,511,737, Cl. 564-257.000.

Buechi, Heinz: *See—*
Hochstrasser, Otto; Heine, Hans G.; and Buechi, Heinz, 4,511,125, Cl. 266-135.000.

Buettner, Howard L.: *See—*
Witalka, Jerome J.; Buettner, Howard L.; and Ellsworth, James G., 4,511,967, Cl. 364-200.000.

Bugaut, Andree : *See—*
Monnais, Christian; Cotteret, Jean; and Bugaut, Andree , 4,511,360, Cl. 8-405.000.

Builder, Stuart E.; and Ogez, John R., to Genentech, Inc. Purification and activity assurance of precipitated heterologous proteins. 4,511,502, Cl. 260-112.00R.

Bulaty, Paul; De Mesmaeker, Ivan; Franc, Zdenek; and Salerno, Giuseppe, to BBC Brown, Boveri & Company, Limited. Method and a system for analyzing the secondary current in a current transformer, the primary side of which is connected into a line of an electric energy supply network. 4,511,839, Cl. 324-127.000.

Bulle, Marshall R.; and Johnson, Dale A. Tire spreader. 4,511,121, Cl. 254-50.400.

Bunnelle, Philip R., to FMC Corporation. Circuitry for operating an extendible boom and a service line. 4,510,971, Cl. 137-615.000.

Bunner, Charles B. D.; and Brombal, David S., to Northern Telecom Limited. Backpanel assemblies. 4,511,950, Cl. 361-413.000.

Bunting Magnetics Company: *See—*
Meister, Richard P., 4,511,028, Cl. 198-497.000.

Burba, John L., III: *See—*
Wang, Chun S.; Benkendorfer, Kyle B.; and Burba, John L., III, 4,511,710, Cl. 528-485.000.

Burgemeister, Eduard A., to N.V. Optische Industrie "De Oude Delft" . Method for making electrical contacts to diamond by means of a laser, and diamond provided with contacts according to this optical method. 4,511,783, Cl. 219-121.0LM.

Burger, Norman J.: *See—*
Goldfarb, Adolph E.; Everitt, Delmar K.; and Burger, Norman J., 4,511,343, Cl. 446-463.000.

Burns, Richard J.: *See—*
Mayer, Walter P.; and Burns, Richard J., 4,511,682, Cl. 523-402.000.

Burrage, Martin E.: *See—*
Drake, Cyril F.; Jones, Ronald; Bateson, Paul F.; Grant, Ronald J.; and Burrage, Martin E., 4,511,404, Cl. 106-14.120.

Burrough, Donald E.: *See—*
Campbell, Hallis D.; and Burrough, Donald E., 4,510,741, Cl. 56-341.000.

Burroughs Corporation: *See—*
Peterson, LuVerne R., 4,511,995, Cl. 365-8.000.
Phelps, Andrew E.; and Ta-Ming Wu, Allen, 4,512,018, Cl. 370-112.000.

Burroughs Wellcome Co.: *See—*
Bair, Kenneth W., 4,511,582, Cl. 514-654.000.

Burrows, Aubrey L.; Mabley, Paul B.; and Field, Steven J., to Ethyl Petroleum Additives, Inc. Liquid fuels and concentrates containing corrosion inhibitors. 4,511,366, Cl. 44-53.000.

Busby, David C.: *See—*
Wegman, Richard W.; and Busby, David C., 4,511,741, Cl. 568-484.000.

Bush, Elmer R., to Timetco Corporation. Terminated inverted V antenna with matching transformer. 4,511,898, Cl. 343-736.000.

Bush, Randall G., to Sunbeam Plastics Corporation. Child resistant safety container. 4,511,032, Cl. 206-1.500.

Bushnell, James D.: *See—*
Fiocco, Robert J.; and Bushnell, James D., 4,511,537, Cl. 422-256.000.

Busman, Stanley C.; and Chang, John C., to Minnesota Mining and Manufacturing Company. Metal film imaging structure. 4,511,641, Cl. 430-158.000.

Butke, Charles J.: *See—*
Requejo, Luz P.; and Butke, Charles J., 4,511,489, Cl. 252-172.000.

Butler, Barry L., to United States of America, Energy. Lightweight diaphragm mirror module system for solar collectors. 4,511,215, Cl. 350-295.000.

Butter, Johannes A. M.: *See—*
Ploegaert, Hendrikus T.; Molenaar, Ronald N.; and Butter, Johannes A. M., 4,510,793, Cl. 73-86.000.

Buysch, Hans-Josef: *See—*
Krimm, Heinrich; Buysch, Hans-Josef; Lange, Peter M.; and Klipper, Reinhold, 4,511,722, Cl. 548-231.000.

Byatt, Dennis W. G.; and Walker, John W., to Marconi Co. Ltd., The; and Occidental Refineries Ltd. Distance measuring. 4,510,804, Cl. 73-290.00V.

Byers, John E. Sharpener device with guide means. 4,510,824, Cl. 76-86.000.

Byvik, Charles E.: *See—*
Reichman, Benjamin; and Byvik, Charles E., 4,511,838, Cl. 324-71.500.

C & A Products, Inc.: *See—*
Serev, Peter G.; and Bogin, Roger M., 4,511,884, Cl. 340-347.0SY.

C-Cor Labs, Inc.: *See—*
Schrock, Clifford B., 4,512,033, Cl. 455-2.000.

C.R.O. Inc.: *See—*
Schuettpelz, Daryl, 4,511,977, Cl. 364-475.000.

C. Reichert Optische Werke, AG: *See—*
Sitte, Helmuth; Cooper, Terry W.; and Kleber, Heinrich, 4,511,224, Cl. 350-523.000.

Cadillac, Joseph A. Mount for a power rescue tool. 4,511,109, Cl. 248-310.000.

Cadwell, Gilbert C., to Rohr Industries, Inc. Rotating punch die system. 4,510,780, Cl. 72-57.000.

Caffrey, Stephen F.: *See—*
Ingermann, Donald E.; Smith, Ronald L.; Knoll, Jimmie L.; Caffrey, Stephen F.; Barsi, Endre; and Dechant, Joseph C., 4,510,642, Cl. 15-231.000.

Caillat, Pierre, to Thomson-CSF. Focussing solenoid, application thereof and a process for manufacturing same. 4,511,870, Cl. 335-213.000.

Caldwell, David; and Agrawal, Mahendra P., to Texas Instruments Incorporated. Method of entering and performing operations on complex numbers on calculators. 4,511,987, Cl. 364-715.000.

Caldwell, Marion J. Low-lactose, low-galactose imitation milk product. 4,511,590, Cl. 426-580.000.

California Linear Circuits, Inc.: *See—*
Yakura, John, 4,510,672, Cl. 29-574.000.

Camco, Incorporated: *See—*
Pringle, Ronald E., 4,510,994, Cl. 166-156.000.
Campa, Eddie L. Apparatus for disassembling a universal joint. 4,510,661, Cl. 29-259.000.
Campbell, Hallis D.; and Burrough, Donald E., to Gehl Company. Rotary crop baler. 4,510,741, Cl. 56-341.000.
Campbell, Willis R.; and Blanshine, Allison W., to Sperry Corporation. Continuous roll baling machine. 4,510,861, Cl. 100-88.000.
Canadian Patents & Development Limited: *See—*
Dauphinee, Thomas M.; and Kirby, Christopher G. M., 4,511,845, Cl. 324-444.000.
Canberra Industries, Inc.: *See—*
Tench, Orren K., Jr., 4,510,758, Cl. 62-45.000.
Cannella, Vincent D.: *See—*
Izu, Masatsugu; and Cannella, Vincent D., 4,510,674, Cl. 29-574.000.
Izu, Masatsugu; and Cannella, Vincent D., 4,510,675, Cl. 29-574.000.
Canon Kabushiki Kaisha: *See—*
Fujimoto, Ryo, 4,511,916, Cl. 358-28.000.
Kanbe, Junichiro; and Hosono, Nagao, 4,511,239, Cl. 355-3.0DD.
Suzuki, Koji; Kuroda, Kouki; and Nagahira, Jyoji, 4,511,240, Cl. 355-14.00R.
Takahashi, Tohru; Tajima, Hatsuo; Shigenobu, Michio; and Washiyama, Shigemichi, 4,511,778, Cl. 219-10.55A.
Ushiro, Tatsuzo, 4,511,932, Cl. 360-33.100.
Yamada, Yasuaki; Ozawa, Toshiaki; and Kondo, Hiroatsu, 4,511,830, Cl. 318-318.000.
Yamada, Yasuyuki, 4,511,232, Cl. 354-403.000.
Car-Go, Corp.: *See—*
Woods, Richard E.; and Bradburn, Marvin D., 4,510,858, Cl. 100-35.000.
Cardarelli, Bernadette: *See—*
Cardarelli, Nathan; and Cardarelli, Bernadette, 4,511,551, Cl. 424-1.100.
Cardarelli, Nathan; and Cardarelli, Bernadette, to Unique Technologies, Incorporated. Method and composition for the detection of a precancerous or leukemic condition in mammals. 4,511,551, Cl. 424-1.100.
Cardiac Recorders Limited: *See—*
Spencer, Joseph, 4,510,935, Cl. 128-419.00D.
Carl Freudenberg, Firma: *See—*
Ohta, Nobuo, 4,511,615, Cl. 428-198.000.
Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See—*
Leitz, Helmut, 4,510,695, Cl. 33-293.000.
Carlson, Franklin J. Removable protective skirt for a tank. 4,511,055, Cl. 220-69.000.
Carminati, Julien, to Centre de Production Mecanique. Spoke dispenser for spoked wheels in a spoke-fitting machine. 4,511,058, Cl. 221-2.000.
Carmon, Shmuel: *See—*
Keren, Yehuda; Carmon, Shmuel; Behar, Meyer; and Axelrod, Shimshon, 4,511,543, Cl. 423-167.000.
Carpanzano, Carmine, to Air Structures International. Cable tie for an air supported structure cable net. 4,511,279, Cl. 403-266.000.
Carr, Arthur E.: *See—*
Erlam, David P.; and Carr, Arthur E., 4,511,199, Cl. 339-45.00M.
Carrier Corporation: *See—*
Fraser, Howard H., Jr.; and Anderson, George A., III, 4,511,314, Cl. 417-363.000.
Carrington, Harry: *See—*
Park, George; Smith, Michael J.; and Carrington, Harry, 4,511,194, Cl. 312-12.000.
Carsonite International Corporation: *See—*
Schmanski, Donald W., 4,511,281, Cl. 404-10.000.
Cartwright, Neil B. Photographic processing apparatus including a rocking platform and a rolling developing tank. 4,511,230, Cl. 354-299.000.
Caruso, Richard. Hair curler. 4,510,953, Cl. 132-40.000.
Casey, Gary L., to Allied Corporation. Vacuum operated idle speed control device. 4,510,904, Cl. 123-339.000.
Cassonnet, Jean-Claude M.; and Lamarche nee Lechevin, Marie-Odile, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Apparatus for controlling microinstructions stored in a data processing unit memory. 4,511,983, Cl. 364-200.000.
Castelli, Renato, to Samsonite Corporation. Tidy element provided with several compartments. 4,511,036, Cl. 206-371.000.
Castelli S.p.A.: *See—*
Ponzellini, Giulio, 4,511,108, Cl. 248-188.700.
Catalysts & Chemicals Industries Co., Ltd.: *See—*
Nozue, Ikutoshi; Fujii, Susumu; and Hanada, Masayuki, 4,511,668, Cl. 502-84.000.
Cavalier Corporation: *See—*
Lindsey, James C., 4,511,060, Cl. 221-115.000.
Manzer, Marvin R., 4,511,059, Cl. 221-115.000.
Cave, Ben R.: *See—*
Roberts, Charles D.; and Cave, Ben R., 4,511,124, Cl. 266-44.000.
Cawley, William E., to United States of America, Energy. Centrally activated pipe snubbing system. 4,511,114, Cl. 248-550.000.
Caye, Paul D.; Jamain, Patrice C.; and Weisser, Bernard G., to Societe Nationale Industrielle Aerospatiale. Kinetic wheel arrangement incorporating magnetic bearings, particularly for storing energy. 4,511,190, Cl. 308-10.000.
Cegedur Societe de Transformation de l'Aluminium Pechiney: *See—*
Ferton, Daniel; and Mace, Robert, 4,511,409, Cl. 148-2.000.
Celanese Corporation: *See—*
Dolce, Thomas J.; and Vijayendran, Bheema R., 4,511,527, Cl. 264-328.200.
Hicks, Darrell D., 4,511,732, Cl. 560-221.000.
Centre de Production Mecanique: *See—*
Carminati, Julien, 4,511,058, Cl. 221-2.000.
Centre National de la Recherche Scientifique: *See—*
Sella, Claude; Tran-Khanh, Vien; and Martin, Jean-Claude, 4,511,451, Cl. 204-298.000.
Centre Technique du Cuir: *See—*
Play, Dominique; Bonneau, Marc; Merieux, Charles; Herbage, Daniel; and Comte, Philippe, 4,511,653, Cl. 435-69.000.
Centronics Data Computer Corporation: *See—*
Ulvila, Richard M., 4,511,905, Cl. 346-140.00A.
Century International Corp.: *See—*
Ingermann, Donald E.; Smith, Ronald L.; Knoll, Jimmie L.; Caffrey, Stephen F.; Barsi, Endre; and Dechant, Joseph C., 4,510,642, Cl. 15-231.000.
Cessna Aircraft Company, The: *See—*
Jackson, Alan D., 4,510,751, Cl. 60-450.000.
Cetrelli, Renato: *See—*
Rauser, Jan A. I.; and Cetrelli, Renato, 4,511,078, Cl. 229-17.00R.
Chai, Bruce H.; Bailey, Dana S.; Vetelino, John F.; Lee, Donald L.; and Andle, Jeffrey C., to Allied Corporation. Temperature compensated orientation of berlinite for surface acoustic wave devices. 4,511,817, Cl. 310-313.00A.
Champion Corporation: *See—*
Woodruff, Roger D., 4,511,304, Cl. 414-546.000.
Champion International Corporation: *See—*
Roccaforte, Harry I., 4,511,043, Cl. 206-620.000.
Champion Spark Plug Company: *See—*
Nemeth, Joseph; and Kowalski, Charles I., 4,511,524, Cl. 264-61.000.
Chang, Ike Y., to Du Pont de Nemours, E. I., and Company. Reinforced composites. 4,511,690, Cl. 524-606.000.
Chang, John C.: *See—*
Busman, Stanley C.; and Chang, John C., 4,511,641, Cl. 430-158.000.
Chang, Michael N.; and Biftu, Tesfaye, to Merck & Co., Inc. 5-(Pyrrol-2-oyl)-1,2-dihydro-3H-pyrrolo [1,2-a]pyrrole derivatives as anti-inflammatory and analgesic agents. 4,511,724, Cl. 548-452.000.
Chapelain, Jean: *See—*
Nicolas, Alain; and Chapelain, Jean, 4,511,959, Cl. 364-200.000.
Chapman, Colin M.: *See—*
Connell, David E.; and Chapman, Colin M., 4,511,544, Cl. 423-224.000.
Charavit, Jean-Claude; and Vandroux, Michele, to Thomson-CSF. Frequency prepositioning for an indirect frequency synthesizer. 4,511,858, Cl. 331-10.000.
Charles Stark Draper Laboratory, Inc., The: *See—*
Biren, Marvin A., 4,511,222, Cl. 350-441.000.
Bowditch, Philip N., 4,510,626, Cl. 2-115.000.
Chauvin, Yves: *See—*
Seite, Claude; Commereuc, Dominique; and Chauvin, Yves, 4,511,743, Cl. 568-814.000.
Chemagnetics, Inc.: *See—*
Bartuska, Victor J.; Lewis, David H.; Lewis, Robin B.; and Dalbow, David G., 4,511,841, Cl. 324-321.000.
Chen, Lee; and Mathad, Gangadhara S., to International Business Machines Corporation. Control of etch rate ratio of SiO_2/photoresist for quartz planarization etch back process. 4,511,430, Cl. 156-643.000.
Chen, Lien-Yan: *See—*
Jennings, Charles E.; Barrington, Claud C.; Chen, Lien-Yan; Hopkins, Bob C.; McIntyre, John N.; and Regitz, Alfred P., 4,510,960, Cl. 137-75.000.
Chen, Ted. Looseleaf binder assembly. 4,511,274, Cl. 402-21.000.
Chenausky, Peter P.; and Hart, Richard A., to United Technologies Corporation. Passively Q-switched square bore waveguide laser. 4,512,021, Cl. 372-20.000.
Chevron Research Company: *See—*
Connell, David E.; and Chapman, Colin M., 4,511,544, Cl. 423-224.000.
Magee, Philip S., 4,511,735, Cl. 514-601.000.
Miller, Stephen J., 4,511,746, Cl. 585-323.000.
Miller, Stephen J., 4,511,750, Cl. 585-526.000.
Chiang, Yuan C.: *See—*
Lambert, Jack L.; and Chiang, Yuan C., 4,511,658, Cl. 436-130.000.
Chiba, Hiroshi: *See—*
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,511,133, Cl. 271-3.100.
Chicago Bridge & Iron Company: *See—*
Ludwigsen, John S., 4,511,115, Cl. 248-562.000.
Chicago Cutlery Consumer Products, Inc.: *See—*
Tolentino, John, 4,511,040, Cl. 206-553.000.
Chiu, Herman S.: *See—*
Nicholson, Myron D.; and Chiu, Herman S., 4,511,613, Cl. 428-36.000.
Chrysler Corporation: *See—*
Ruehle, Edward A., 4,511,112, Cl. 248-544.000.
Chu, Richard, to International Business Machines Corporation. Method of assembling magnetic pins into printed circuit boards. 4,510,685, Cl. 29-837.000.
Ciba-Geigy Corporation: *See—*
Berner, Godwin, 4,511,596, Cl. 427-44.000.
Boger, Manfred; Ehrenfreund, Josef; Martin, Pierre; and Steiner, Eginhard, 4,511,571, Cl. 514-351.000.

Drabek, Jozef, 4,511,578, Cl. 514-469.000.
Gallay, Jean J.; and Schweizer, Ernst, 4,511,567, Cl. 514-253.000.
Renfroe, Harris B., 4,511,573, Cl. 514-332.000.
Cillario, Lorenzo, to Ferrero S.p.A. Wrapping of spherical objects having small protrusions. 4,510,735, Cl. 53-464.000.
Cincinnati Incorporated: *See—*
Graf, Raymond J., 4,511,976, Cl. 364-474.000.
CISE Centro Informazioni Studi Esperienze S.p.A.: *See—*
Bastida, Ezio M.; and Bergamini, Paolo, 4,511,860, Cl. 331-96.000.
Clarion Co., Ltd.: *See—*
Hayashi, Hideki; Ito, Yukio; Akiike, Yukio; and Kinoshita, Shigeo, 4,511,103, Cl. 242-186.000.
Kishida, Toshio, 4,511,854, Cl. 330-279.000.
Yamaguchi, Katsumi; Takai, Kazuki; and Okada, Hitoshi, 4,511,940, Cl. 360-96.600.
Claywell, Carol S.: *See—*
Outlaw, Benjamin T.; Oude Alink, Bernardus A.; Kelley, Joe A.; and Claywell, Carol S., 4,511,480, Cl. 252-8.55E.
Cleary, James D.: *See—*
Scebold, Robert A.; and Cleary, James D., 4,511,331, Cl. 433-17.000.
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., to UOP Inc. Process for separating oleic acid from linoleic acid. 4,511,514, Cl. 260-419.000.
Clorox Company, The: *See—*
Stanislowski, Anna G.; and Wiersema, Richard J., 4,511,490, Cl. 252-174.120.
Clymer, John C.: *See—*
Tatham, Edward J.; Kravits, Richard; Clymer, John C.; and Hoffman, Carvel D., 4,511,801, Cl. 250-394.000.
Coal Industry Patents Limited: *See—*
Robinson, Joseph G.; and Riemer, Pierce W. F., 4,511,749, Cl. 585-469.000.
Coburn Optical Industries, Inc.: *See—*
Sherwin, Dewayne J., 4,510,717, Cl. 51-58.000.
Cocain, Harry W.: *See—*
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., 4,511,699, Cl. 525-205.000.
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., 4,511,700, Cl. 525-283.000.
Coderre, James C.: *See—*
Tung, Chi F.; and Coderre, James C., 4,511,210, Cl. 350-105.000.
Cody, Michael J.: *See—*
Marcus, Konrad H.; and Cody, Michael J., 4,511,954, Cl. 362-275.000.
Coen Company, Inc.: *See—*
Voorheis, Temple S., 4,511,325, Cl. 431-10.000.
Cohen, Joel S.: *See—*
Druffel, James B.; and Cohen, Joel S., 4,511,113, Cl. 248-546.000.
Colaruotolo, Joseph F.; Irvine, Robert L.; Ketchum, Lloyd H., Jr.; and Ying, Wei-chi, to Occidental Chemical Corporation. Treatment of obnoxious chemical wastes. 4,511,657, Cl. 435-253.000.
Collot, Jean, to Association pour la Recherche et le Developpemente des Methods et Processus Industrieles (Armines). Method and apparatus for casting metal alloys in the thixotropic state. 4,510,987, Cl. 164-71.100.
Collumeau, Yoland, to Thomson CSF. Cases with flat terminal lugs for medium power semi-conductor components and a process for manufacturing same. 4,510,677, Cl. 29-588.000.
Colomb, Denis G., to Sonics Research Corporation. System and method for high quality image reproduction with grayscale image print while store capability. 4,511,928, Cl. 358-280.000.
Columbia Gas Systems Service Corp.: *See—*
Dukat, Alexander J., 4,511,444, Cl. 204-148.000.
Combustion Engineering, Inc.: *See—*
Blaskowski, Henry J., 4,511,371, Cl. 48-197.00R.
Wincze, Steven P.; and Rickard, Earl K., 4,510,892, Cl. 122-510.000.
Commereuc, Dominique: *See—*
Seite, Claude; Commereuc, Dominique; and Chauvin, Yves, 4,511,743, Cl. 568-814.000.
Commissariat a l'Energie Atomique: *See—*
Barraud, Andre ; and Leloup, Jean, 4,511,604, Cl. 427-402.000.
Compagnie Industrielle des Telecommunications Cita-Alcatel: *See—*
Morel, Jacques; and Tallon, Jacques, 4,510,792, Cl. 73-40.700.
Morel, Jacques; and Tallon, Jacques, 4,510,792, Cl. 73-40.700.
Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See—*
Cassonnet, Jean-Claude M.; and Lamarche nee Lechevin, Marie-Odile, 4,511,983, Cl. 364-200.000.
Componenti Grafici S.r.l.: *See—*
Molinatto, Bruno, 4,510,865, Cl. 101-153.000.
Computer & Communications Technology Corp.: *See—*
Valstyn, Erich P., 4,511,942, Cl. 360-126.000.
Comte, Philippe: *See—*
Play, Dominique; Bonneau, Marc; Merieux, Charles; Herbage, Daniel; and Comte, Philippe, 4,511,653, Cl. 435-69.000.
Conley, Richard W.; Tremblay, Richard P.; Bolam, Charles W.; Logan, James E.; and Krueger, David A., to Kerotest Manufacturing Corp. Plastic service valve. 4,511,120, Cl. 251-288.000.
Connell, David E.; and Chapman, Colin M., to Chevron Research Company. Hydrogen sulfide removal process. 4,511,544, Cl. 423-224.000.
Connor, John T.; Halsted, Charles P.; and Ravn, Jacob, to West Company, The. Seal force monitor apparatus, system, and method for in-process determination of integrity of sealed containers. 4,511,044, Cl. 209-522.000.
Consolidated Natural Gas Service Company, Inc.: *See—*
Hise, Ralph E.; and Swenson, Paul F., 4,510,756, Cl. 60-659.000.
Consortium fur Elektrochemische: *See—*
Kreuzer, Franz-Heinrich; Glauberman, Gisela; and Bosch, Erhard, 4,511,728, Cl. 556-419.000.
Constantinescu, Dan, to Constantinescu, Dan. Method and apparatus for treating a living body. 4,510,925, Cl. 128-1.300.
Container Corporation of America: *See—*
Lopez, Louis, 4,511,079, Cl. 229-34.00R.
Continental Gummi-Werke Aktiengesellschaft: *See—*
Sohnemann, Richard, 4,511,697, Cl. 525-139.000.
Control Data Corporation: *See—*
Webb, David M.; and Lane, Thomas A., 4,511,994, Cl. 364-900.000.
Cook, Thomas E., to Durametallic Corporation. One-piece mounting ring for seal insert. 4,511,151, Cl. 277-92.000.
Cooper, Terry W.: *See—*
Sitte, Helmuth; Cooper, Terry W.; and Kleber, Heinrich, 4,511,224, Cl. 350-523.000.
Cordis Corporation: *See—*
Barreras, Francisco J., 4,510,945, Cl. 128-696.000.
Cornils, Boy; Weber, Jurgen; Tihanyi, Bela; and DeWin, Werner, to Ruhrchemie Aktiengesellschaft; and M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Solar-selective layers and method for producing same. 4,511,439, Cl. 204-37.100.
Corning Glass Works: *See—*
Taylor, Mark P., 4,511,663, Cl. 501-4.000.
Thompson, David A., 4,511,515, Cl. 260-429.200.
Corsette, Douglas F. Manually actuated pump having pliant piston. 4,511,065, Cl. 222-153.000.
Cotteret, Jean: *See—*
Monnais, Christian; Cotteret, Jean; and Bugaut, Andree , 4,511,360, Cl. 8-405.000.
Cotton, Curran D., to Maytag Company, The. Control system for a combined appliance. 4,510,778, Cl. 68-12.00R.
Couch, Robert P., to United Technologies Corporation. Afterburner flameholder ion probe. 4,510,794, Cl. 73-116.000.
Coursen, David L., to Du Pont de Nemours, E. I., and Company. Apparatus and method for transferring a Bingham solid through a long conduit. 4,510,958, Cl. 137-13.000.
Coury, Glenn E. Method of separating a noncondensable gas from a condensable vapor. 4,511,376, Cl. 55-36.000.
Cousins III, Matthew E., to United States of America, Army. Remote sensor system with bi-directional monitoring and control of operation. 4,511,896, Cl. 340-870.250.
Cousse, Henri: *See—*
Pitet, Guy; Cousse, Henri; and Mouzin, Gilbert, 4,511,566, Cl. 514-242.000.
Cowan, Edwin J. Infrared water heater. 4,510,890, Cl. 122-17.000.
Cox, James P. Deodorant-dispensing products and dispensing process. 4,511,552, Cl. 424-14.000.
Crane, Joseph J., to Crossfield Data Systems, Inc. Scanning system wherein the scanning beam rotates and translates. 4,511,205, Cl. 350-6.100.
Craver, Joseph N.; and Horner, Jerome T., to Union Carbide Corporation. Multilayer trash bag film. 4,511,609, Cl. 428-35.000.
Creagh, Linda T., to Xerox Corporation. Electromechanical transducer protecting. 4,511,598, Cl. 427-58.000.
Creedon, Richard L., to GA Technologies Inc. Bow action valve. 4,510,972, Cl. 137-625.280.
Cromeens, Jeff Y., to Industrial Woodworking Machine Co. Inc. Apparatus for guiding a powered circular saw along an elliptical cutting path. 4,510,835, Cl. 83-471.200.
Crossfield Data Systems, Inc.: *See—*
Crane, Joseph J., 4,511,205, Cl. 350-6.100.
Crossland, William A.; Ross, Peter W.; and Ayliffe, Peter J., to International Standard Electric Corporation. Scanning liquid crystal display cells. 4,511,926, Cl. 358-236.000.
Crossman, William W., Jr.: *See—*
Ferguson, Robert W.; Andors, Derik K.; and Crossman, William W., Jr., 4,510,918, Cl. 126-79.000.
Crowley, John E., to Houdaille Industries, Inc. Apparatus for applying a force. 4,510,977, Cl. 140-123.000.
Crozer-Chester Medical Center: *See—*
Lewbart, Marvin L., 4,511,511, Cl. 260-239.55D.
Crussard, Charles; Maurel, Pierre; and Bonhomme, Jean, to Pechiney Ugine Kuhlmann. Exploitation of copper, nickel and cobalt by treating manganiferous matrix oxidized ores. 4,511,540, Cl. 423-26.000.
Curinier, Jean; and Pinet, Philippe, to Etablissements les Fils d'Auguste Chomarat & Cie. Rotating creel for a nonwoven fabric machine. 4,510,657, Cl. 28-100.000.
Curran, Richard F. Combination backpack frame and cot. 4,511,071, Cl. 224-156.000.
Curtis, Thad C., Sr. Water exchanger and method for evaporative cooler. 4,510,766, Cl. 62-171.000.
Cusack, Robert F., to GTE Valeron Corporation. Probe with stylus adjustment. 4,510,693, Cl. 33-174.00L.
D.V.T. Buro fur Anwendung Deutscher Verfahrenstechnik H. Morsy: *See—*
el Din Nasser, Gamal, 4,511,436, Cl. 202-174.000.
Dahan, Gilbert M. I.: *See—*
Boy-Marcotte, Jean-Louis; Dahan, Gilbert M. I.; Dancette, Michel; Le Nabour, Marcel P.; Pellerin, Jean-Francois G. A.; Rivallin, Jose ; and Jannot, Marcel A. J., 4,511,805, Cl. 290-2.000.

Daicel Chemical Industries, Ltd.: *See*—
Nakanishi, Michio; and Nakashima, Naoki, 4,511,687, Cl. 524-270.000.
Yuki, Heimei; and Okamoto, Yoshio, 4,511,475, Cl. 210-635.000.
Daihatsu Motor Company Limited: *See*—
Yoshida, Ryo, 4,510,747, Cl. 60-343.000.
Daikin Kogyo Co., Ltd.: *See*—
Hisamoto, Iwao; Maeda, Chiaki; and Hirai, Masaru, 4,511,733, Cl. 560-253.000.
Daimler-Benz Aktiengesellschaft: *See*—
Ehrlich, Willibald; Jooss, Hans; and Hornung, Rainer, 4,511,606, Cl. 427-386.000.
Klein, Wilhelm; Koske, Jorg; Herzog, Siegfried; Jordan, Hans-Peter; Bauer, Wilhelm; Bausch, Max; and Grabner, Christian, 4,511,214, Cl. 350-632.000.
Rauneker, Josef, 4,511,012, Cl. 180-65.200.
Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Sakamoto, Takashi, 4,511,989, Cl. 364-723.000.
Dalbow, David G.: *See*—
Bartuska, Victor J.; Lewis, David H.; Lewis, Robin B.; and Dalbow, David G., 4,511,841, Cl. 324-321.000.
Daloisio, Pasquale C., to Plastech International, Inc. Tilt truck. 4,511,154, Cl. 280-47.260.
Damin, Bernard: *See*—
Denis, Jacques; Sillion, Bernard; Damin, Bernard; and Leger, Robert, 4,511,369, Cl. 44-62.000.
Dancette, Michel: *See*—
Boy-Marcotte, Jean-Louis; Dahan, Gilbert M. I.; Dancette, Michel; Le Nabour, Marcel P.; Pellerin, Jean-Francois G. A.; Rivallin, Jose ; and Jannot, Marcel A. J., 4,511,805, Cl. 290-2.000.
Dancsik, Joseph J. Rotary table. 4,511,128, Cl. 269-61.000.
Dandy, Donny C.: *See*—
Varga, Sandor I.; Dougherty, Richard L.; Dandy, Donny C.; and Thomas, Willie J., 4,511,158, Cl. 280-292.000.
Dauphinee, Thomas M.; and Kirby, Christopher G. M., to Canadian Patents & Development Limited. Salinometer. 4,511,845, Cl. 324-444.000.
Davidson, Douglass S.: *See*—
Frommer, Jane E.; Elsenbaumer, Ronald L.; and Davidson, Douglass S., 4,511,494, Cl. 252-518.000.
Davis, Burtron H.: *See*—
Baumert, Kenneth L.; Sagues, Alberto A.; and Davis, Burtron H., 4,511,453, Cl. 208-8.0LE.
Baumert, Kenneth L.; Sagues, Alberto A.; and Davis, Burtron H., 4,511,460, Cl. 208-348.000.
Davis, Darrell E.: *See*—
Victor, Alan M.; and Davis, Darrell E., 4,512,035, Cl. 455-165.000.
Davis, James A.: *See*—
Kang, Jung W.; and Davis, James A., 4,511,628, Cl. 428-457.000.
Dayco Corporation: *See*—
Standley, Paul M., 4,511,521, Cl. 264-24.000.
DCI, Inc.: *See*—
Saucier, David O., 4,511,255, Cl. 366-138.000.
De La Rue Systems Limited: *See*—
Wood, John; and Dominey, Raymond J., 4,511,795, Cl. 235-379.000.
DeAngelis, Barbara; Jacobsen, Howard; and Jacobsen, Edwin. Shield assembly for an area of an animal to be protected. 4,510,888, Cl. 119-143.000.
Deasy, Richard E., to Rockwell International Corporation. Current enhanced monopole radiation type antenna apparatus. 4,511,900, Cl. 343-845.000.
Deborde, Albert H.; and Grandvallet, Gilles, to Saurer Diederichs (Societe Anonyme). Flow distributor for fluid circuit and its application to shuttleless looms with pneumatic insertion of the weft. 4,510,976, Cl. 139-435.000.
deCelle, Charles W., to Franco, Ralph A.; and Franco, Lila K., part interest to each. Vaporizing fuel system for internal combustion engine. 4,510,913, Cl. 123-557.000.
Dechant, Joseph C.: *See*—
Ingermann, Donald E.; Smith, Ronald L.; Knoll, Jimmie L.; Caffrey, Stephen F.; Barsi, Endre; and Dechant, Joseph C., 4,510,642, Cl. 15-231.000.
Decoene, Frans J. G. C.; Strubbe, Gilbert J. I.; and Todd, Robert R., to Sperry Corporation. Infeed mechanism for rotary cleaning device in combines. 4,510,946, Cl. 130-27.00T.
DeCuir, Perry J., Sr.: *See*—
Guidry, Shelby L.; and DeCuir, Perry J., Sr., 4,510,797, Cl. 73-151.000.
Deere & Company: *See*—
Espiritu Santo, Eugenio; Baxter, Kenneth D.; and Bluem, Gary R., 4,510,814, Cl. 73-862.570.
Degussa Aktiengesellschaft: *See*—
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,511,719, Cl. 546-245.000.
de Haan, Atze: *See*—
Groothuis, Gerrit J.; de Haan, Atze; Poel, Hendrik; Tietjens, Eduard W.; and de Vries, Jochem J., 4,510,687, Cl. 30-34.200.
Dekeyzer, Marcel A., to Sperry Corporation. Discharge assist means for combine harvesters. 4,510,948, Cl. 130-27.00R.
de Kroon, Jan, to Akzo N.V. Rope comprising two or more polymer components. 4,510,743, Cl. 57-260.000.
Deline, Gordon R.: *See*—
Bowden, Edgar A.; Deline, Gordon R.; and Koeijmans, Gerard D., 4,511,999, Cl. 367-23.000.
Delta Engineering Co.: *See*—
Robinson, Richard T., 4,511,278, Cl. 403-172.000.
De Mesmaeker, Ivan: *See*—
Bulaty, Paul; De Mesmaeker, Ivan; Franc, Zdenek; and Salerno, Giuseppe, 4,511,839, Cl. 324-127.000.
Deneen, Michael. Apparatus for drilling a plurality of bores in a lawn. 4,511,004, Cl. 172-21.000.
de Niet, Edmond: *See*—
Hofelt, Martijn H. H.; de Niet, Edmond; and Rijckaert, Albert M. A., 4,511,933, Cl. 360-47.000.
Denis, Jacques; Sillion, Bernard; Damin, Bernard; and Leger, Robert, to Institut Francais du Petrole; and Elf France. Copolymers with nitrogen groups, useful as additives for decreasing the cloud point of hydrocarbon middle distillates and compositions containing them. 4,511,369, Cl. 44-62.000.
Dennison Manufacturing Company: *See*—
Boyd, Mary G.; Smith, Donald R.; Imondi, Peter F.; Hiatt, Norman A.; Bauer, Fritz E.; Anemaet, John M.; and MacKenzie, Alfred K., 4,511,425, Cl. 156-493.000.
Margerum, Edward S.; and Hiatt, Norman A., 4,511,602, Cl. 427-148.000.
Pitts, Warren R.; and Salit, Herbert W., 4,511,616, Cl. 428-203.000.
Denton, Robert D.: *See*—
Valencia, Jaime A.; and Denton, Robert D., 4,511,382, Cl. 62-20.000.
Depcik, Hans-Werner: *See*—
Schauf, Dieter; Protoschill, Klaus; Oberbach, Karl; and Depcik, Hans-Werner, 4,511,184, Cl. 301-63.0PW.
de Riviere, Charles, to Thomson-CSF. Modulating device for a single-sideband modulation system. 4,511,864, Cl. 332-41.000.
Desai, Avinash J.; and Kreikebaum, Gerhard, to Owens-Corning Fiberglas Corporation. Electronic balance meter. 4,511,791, Cl. 219-497.000.
Desai, Kirit C., to Owens-Illinois, Inc. Child-resistant package with tamper indicating device. 4,511,051, Cl. 215-225.000.
de Vries, Jochem J.: *See*—
Groothuis, Gerrit J.; de Haan, Atze; Poel, Hendrik; Tietjens, Eduard W.; and de Vries, Jochem J., 4,510,687, Cl. 30-34.200.
Devriese, Thierry E. G., to Sperry Corporation. Combine harvester straw hood. 4,510,947, Cl. 130-27.00B.
Dewan, Shashi B.; and Adams, Graham R., to Park-Ohio Industries, Inc. Power inverter using separate starting inverter. 4,511,956, Cl. 363-49.000.
DeWin, Werner: *See*—
Cornils, Boy; Weber, Jurgen; Tihanyi, Bela; and DeWin, Werner, 4,511,439, Cl. 204-37.100.
Dhont, Andre G. J.: *See*—
Witdoek, Daniel C.; and Dhont, Andre G. J., 4,511,348, Cl. 474-109.000.
Diamond, Michael K. Moisture controlling lingual dental mirror. 4,511,329, Cl. 433-31.000.
Didchenko, Rostislav: *See*—
Nazem, Faramarz; Didchenko, Rostislav; and Fink, David, 4,511,625, Cl. 428-401.000.
Diedrich, Brian J.; and Wolf, Leslie G., II. Infant carrier. 4,510,634, Cl. 5-98.00B.
Diemer, Peter; Brake, Werner; and Dittmer, Rainer, to Krupp-Koppers GmbH. Process for the elimination of waste water produced upon the desulfurization of coking oven gas by means of wash solution containing organic oxygen-carrier, with simultaneous recovery of elemental sulfur. 4,511,549, Cl. 423-574.00R.
Dienes, Zoltan B., to Thomas & Betts Corporation. Method of sealing an electrical cable. 4,511,415, Cl. 156-48.000.
Diesel Kiki Company, Ltd.: *See*—
Ishizuka, Yutaka; and Shibuya, Tsunenori, 4,511,313, Cl. 417-270.000.
Okazaki, Michio, 4,510,659, Cl. 29-156.80R.
Suzuki, Nobuhiko, 4,510,764, Cl. 62-133.000.
Di Matteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., to Robotic Vision Systems, Inc. Arrangement for sensing the geometric characteristics of an object. 4,511,252, Cl. 356-375.000.
Dinya, Zoltan: *See*—
Mogyorodi, Ferenc; Koppany, Eniko; Bodi, Tibor; Balogh, Karoly; Toth, Istvan; Bognar, Rezso; Makleit, Sandor; Litkei, Gyorgy; Rakosi, Miklos; and Dinya, Zoltan, 4,511,736, Cl. 564-214.000.
DiStefano, Ralph D.; and Moldovan, Nicholas, to Harris Corporation. Bi-metallic electroforming technique. 4,511,438, Cl. 204-4.000.
Dittmar, Charles J., Jr.: *See*—
Hofmann, Lee G.; and Dittmar, Charles J., Jr., 4,511,972, Cl. 364-434.000.
Dittmer, Rainer: *See*—
Diemer, Peter; Brake, Werner; and Dittmer, Rainer, 4,511,549, Cl. 423-574.00R.
Dittner, Adam; Schurr, Heinrich; and Von Wallenberg, Ducius, to Fag Kugelfischer Georg Schafer & Co. Antilocking brake system. 4,511,971, Cl. 364-426.000.
Dixon, Samuel, Jr., to United States of America, Army. Millimeter wave signal limiter having ferrite loaded slots in ground plane of image guide. 4,511,865, Cl. 333-17.00L.
Dluhosch, Kurt, to Fichtel & Sachs Ag. Lawn mower. 4,510,739, Cl. 56-17.500.
Dr. Ing. h.c.f. Porsche AG: *See*—
Ampferer, Herbert, 4,510,898, Cl. 123-192.00R.
Meyer, Juergen, 4,511,104, Cl. 244-118.500.

Dr. Ing. h.c.f. Porsche Aktiengesellschaft: *See*—
Rutschmann, Erwin, 4,510,896, Cl. 123-52.0MB.

Dr. Madaus & Co.: *See*—
Madaus, Rolf; and Gorler, Klaus, 4,511,561, Cl. 424-195.100.

Doe, Peter E.: *See*—
Menary, Robert C.; and Doe, Peter E., 4,511,587, Cl. 426-271.000.

Doell, Hermann, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Lubricating system for gas turbine engines. 4,511,016, Cl. 184-6.110.

Dolce, Thomas J.; and Vijayendran, Bheema R., to Celanese Corporation. Alkali metal salts of cross-linked polymeric microgels as nucleating agents for polyethylene terephthalate molding compositions and method for molding. 4,511,527, Cl. 264-328.200.

Dolfsma, Hendrik: *See*—
Vermeiren, Karel N.; and Dolfsma, Hendrik, 4,511,837, Cl. 324-61.00R.

Doll, Ronald J.: *See*—
Smith, Elizabeth M.; Doll, Ronald J.; and Neustadt, Bernard R., 4,511,569, Cl. 514-290.000.

Dombrowski, Leonard C., to AT&T Bell Laboratories. Apparatus for generating a common output signal as a function of any of a plurality of diverse input signals. 4,511,859, Cl. 331-11.000.

Dominey, Raymond J.: *See*—
Wood, John; and Dominey, Raymond J., 4,511,795, Cl. 235-379.000.

Donat Flamand Inc.: *See*—
Giguere, Jean P., 4,510,715, Cl. 49-488.000.

Dornier System GmbH: *See*—
Westphal, Manfred, 4,511,901, Cl. 343-915.000.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See*—
Kanbe, Mitsuru, 4,511,315, Cl. 417-366.000.

Dosch, Robert G.; Stephens, Howard P.; and Stohl, Frances V., to United States of America, Energy. Catalysis using hydrous metal oxide ion exchanges. 4,511,455, Cl. 208-10.000.

Dose, Peter: *See*—
Lampe, Siegfried; Lehmann, Heinz; and Dose, Peter, 4,511,300, Cl. 414-35.000.

Dougherty, Richard L.: *See*—
Varga, Sandor I.; Dougherty, Richard L.; Dandy, Donny C.; and Thomas, Willie J., 4,511,158, Cl. 280-292.000.

Doussain, Claude: *See*—
Gauthier-Lafaye, Jean; Perron, Robert; and Doussain, Claude, 4,511,517, Cl. 260-549.000.

Doutt, Kingsley A. Cylinder piston rod coupler. 4,511,276, Cl. 403-77.000.

Dow Chemical Company, The: *See*—
Anand, Joginder N.; Revak, Timothy T.; and Rossini, Frank J., 4,510,681, Cl. 29-623.100.
Bergman, Roger W., 4,511,464, Cl. 209-166.000.
McIntyre, James A.; and Phillips, Robert F., 4,511,441, Cl. 204-98.000.
McKinley, Mark J.; and Sanner, Jim W., 4,511,477, Cl. 210-689.000.
Mendoza, Abel; and Otterbacher, Eric W., 4,511,731, Cl. 560-061.000.
Termine, Enrico J.; and Ginter, Sally P., 4,511,688, Cl. 524-380.000.
Wallace, Leslie E., 4,511,603, Cl. 427-222.000.
Wang, Chun S.; Benkendorfer, Kyle B.; and Burba, John L., III, 4,511,710, Cl. 528-485.000.

Dow Corning Corporation: *See*—
Kroupa, Loretta A.; and Agbomeirele, Patricia G., 4,511,620, Cl. 428-220.000.

Drabek, Jozef, to Ciba-Geigy Corporation. Acyclamidosulfenylcarbamates for controlling insects. 4,511,578, Cl. 514-469.000.

Drackett Company, The: *See*—
Requejo, Luz P.; and Butke, Charles J., 4,511,489, Cl. 252-172.000.

Dragagna, Claudio: *See*—
Locatelli, Claudio; and Dragagna, Claudio, 4,510,646, Cl. 19-80.00R.

Dragerwerk Aktiengesellschaft: *See*—
Kuhl, Uwe; Krause, Andreas; and Kruger, Horst, 4,511,118, Cl. 251-137.000.
Wendt, Michael; and Schwanbom, Erik, 4,510,933, Cl. 128-207.140.

Drake, Cyril F.; Jones, Ronald; Bateson, Paul F.; Grant, Ronald J.; and Burrage, Martin E., to ITT Industries, Inc. Compositions for inhibiting corrosion of metal surfaces. 4,511,404, Cl. 106-14.120.

Drake, Eldon L., to Dresser Industries, Inc. Centrifugal pump. 4,511,307, Cl. 415-172.00R.

Dresser Industries, Inc.: *See*—
Brunson, David T., 4,511,008, Cl. 175-369.000.
Drake, Eldon L., 4,511,307, Cl. 415-172.00R.

Drexelbrook Controls, Inc.: *See*—
Maltby, Frederick L.; Loewenstern, Kenneth M.; and Benning, Jack G., Jr., 4,511,948, Cl. 361-280.000.

DrM, Dr. Muller AG: *See*—
Muller, Hans, 4,511,471, Cl. 210-323.200.

Druffel, James B.; and Cohen, Joel S., to Prescolite, a division of U.S. Industries. Hangar device for a recessed lighting unit. 4,511,113, Cl. 248-546.000.

Duchene, Eloi; and Laroche, Pierre, to Glaverbel. Laminated reflective panels. 4,511,618, Cl. 428-215.000.

Dudar, Erzebet: *See*—
Gorog, Katalin; Dudar, Erzebet; Gardi, Ivan; Kocsis, Maria; Gaal, Sandor; and Tasnadi, Marta, 4,511,714, Cl. 548-215.000.

Duffy, Michael T.: *See*—
Harbeke, Gunther; and Duffy, Michael T., 4,511,800, Cl. 250-372.000.

DuFries, Ronald W., to Morgan Construction Company. Spinner drive for double block wire drawing machine. 4,511,096, Cl. 242-47.010.

Dukat, Alexander J., to Columbia Gas Systems Service Corp. Backfill for magnesium anodes. 4,511,444, Cl. 204-148.000.

Duke University, Inc.: *See*—
Jobsis, Frans F.; Keizer, Hans H.; and Overaker, Ronald F., 4,510,938, Cl. 128-633.000.

Dumas, Samuel R. Automatic apparatus for positioning footballs for kicking. 4,511,141, Cl. 273-55.00B.

Dunbar Furniture, Inc.: *See*—
Mitchell, Terry L.; and Hodge, David H., 4,511,198, Cl. 339-34.000.

Dunegan Corporation: *See*—
Feng, Ching C., 4,510,812, Cl. 73-644.000.

Dunn, Kenneth. Air cushion lawn mower. 4,510,738, Cl. 56-12.800.

Dunn, William J.: *See*—
Semrow, Carolyn M.; Kolstedt, Mark W.; and Dunn, William J., 4,510,941, Cl. 128-671.000.

Du Pont de Nemours, E. I., and Company: *See*—
Chang, Ike Y., 4,511,690, Cl. 524-606.000.
Coursen, David L., 4,510,958, Cl. 137-13.000.
Falcoff, Allan F.; Mikkelsen, Eric; and Rodrigues, Allan B. J., 4,511,251, Cl. 356-246.000.
Gessell, Donald E., 4,511,669, Cl. 502-110.000.
Kauer, James C., 4,511,390, Cl. 71-88.000.
Romanauskas, William A., 4,511,350, Cl. 494-82.000.
Rorer, Morris P., 4,511,392, Cl. 71-90.000.

Duracell Inc.: *See*—
Karpiloff, Kenneth M., 4,511,416, Cl. 156-69.000.

Durametallic Corporation: *See*—
Cook, Thomas E., 4,511,151, Cl. 277-92.000.

Durbin, Daniel P.; and Korcz, William H., to Shell Oil Company. Method for protectively coating a polymer. 4,511,696, Cl. 525-92.000.

Dureigne, Bernard; Guerillot, Stephane; and Regnault, Alain, to Organisme Autonome Dote de la Personnalite Civile Agence France Presse. System for reconstituting, by filtering, an analog signal from a pseudo-analog signal. 4,511,992, Cl. 364-825.000.

Durst, Jack R., to Pillsbury Company, The. Storage stable, ready-to-eat baked goods. 4,511,585, Cl. 426-106.000.

Duval, Henry H.; Kennedy, Donald; and Muesse, Milton J. Method and apparatus for sealing of pavement seams. 4,511,283, Cl. 404-107.000.

Dyer, Clarence L.: *See*—
Tucker, Raymond M.; and Dyer, Clarence L., 4,511,781, Cl. 219-10.770.

Dynamit Nobel AG: *See*—
Kuhnel, Werner; Putz, Peter; Simm, Manfred; and Spielau, Paul, 4,511,619, Cl. 428-215.000.

Dyson Refractories Limited: *See*—
Brinkman, Richard J., 4,512,023, Cl. 373-36.000.

Dzermejko, Albert J.: *See*—
Bucha, Robert M.; Dzermejko, Albert J.; and Stuart, James G., 4,511,264, Cl. 374-135.000.

E.C.H. Will (GmbH & Co.): *See*—
Lampe, Siegfried; Lehmann, Heinz; and Dose, Peter, 4,511,300, Cl. 414-35.000.

E.G.O. Elektro-Gerate Blanc u. Fischer: *See*—
Goessler, Gerhard; and Wilde, Eugen, 4,511,789, Cl. 219-446.000.

Eastern Company, The: *See*—
Weinerman, Lee S., 4,511,166, Cl. 292-29.000.

Eastin, John A. Manufacturing and using nitrogen fertilizer solutions on a farm. 4,511,389, Cl. 71-54.000.

Eastman Kodak Company: *See*—
Abbas, Daniel C., 4,511,248, Cl. 356-4.000.
Baumeister, Hans P., 4,511,244, Cl. 355-14.0FU.
Bixby, James A., 4,511,931, Cl. 360-10.300.
Wilson, William C.; and Green, Michael H., 4,511,297, Cl. 412-8.000.

Eaton Corporation: *See*—
Benjamin, James A.; and Schutten, Herman P., 4,511,818, Cl. 310-338.000.
Forsell, Kenneth A., 4,511,774, Cl. 200-147.00R.
Glenn, Robert L., 4,511,204, Cl. 339-263.00R.
Link, Donald A.; Swessel, John A., Jr.; and Theisen, Peter J., 4,511,772, Cl. 200-144.00R.

Eaton, Richard H., to General Electric Company. Device for providing attachment to spaced parallel cables or rods. 4,511,203, Cl. 339-255.00P.

Eaton, William L.; and Murray, Alan B. Reduction of harmonics in gas discharge lamp ballasts. 4,511,823, Cl. 315-226.000.

Ebata, Sadao; and Bando, Seiji, to Kawasaki Steel Corporation. Nozzle header for cooling plates. 4,511,089, Cl. 239-553.300.

Ebihara, Hideyuki: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,511,133, Cl. 271-3.100.

Ebisawa, Mikio: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,511,518, Cl. 260-543.00F.

Economics Laboratory, Inc.: *See*—
Olson, John T., 4,511,311, Cl. 417-5.000.

Edenborg, Robert B.: *See*—
Anderson, Jeffrey L.; Ruhoff, Philip J.; and Edenborg, Robert B., 4,511,692, Cl. 525-7.000.

Edmondson, Alan S., to Hulbritt Developments Limited. Apparatus for seal-testing sachets, packets and the like. 4,510,730, Cl. 53-53.000.

Eggers, Harald, to Siemens Aktiengesellschaft. Method for manufacturing a monolithically integrable circuit with a multilayer wiring structure. 4,510,678, Cl. 29-590.000.

Egyt Gyogyszervegyeszeti Gyar: *See—*
Benko, Pal; Ratz nee Simonek, Ildiko ; Pallos, Laszlo ; Magyar, Karoly; Kovacs, Jeno ; Matrai, Erzsebet; Gundel, Janos; and Balogh, Albert, 4,511,717, Cl. 544-353.000.
Budai, Zoltan; Kis-Tamas, Attila; Mezei, Tibor; Lay, Aranka; Vigh, Zoltan; and Sokorai, Agnes, 4,511,737, Cl. 564-257.000.
Ehrenfreund, Josef: *See—*
Boger, Manfred; Ehrenfreund, Josef; Martin, Pierre; and Steiner, Eginhard, 4,511,571, Cl. 514-351.000.
Ehrlich, Johann, Jr., to Patoflex Corporation. Sole for shoes and process for producing said sole. 4,510,702, Cl. 36-86.000.
Ehrlich, Joseph R., to Strombecker Corporation. Bubble composition using multipurpose surfactant base. 4,511,497, Cl. 252-542.000.
Ehrlich, Willibald; Jooss, Hans; and Hornung, Rainer, to Daimler-Benz Aktiengesellschaft. Method for increasing the endurance and reducing the friction of oil lubricated conical roller bearings. 4,511,606, Cl. 427-386.000.
Eichelberger, Charles W.: *See—*
Miller, Edward B.; and Eichelberger, Charles W., 4,511,895, Cl. 340-825.500.
Eichenlaub, Carl, to Loube, Irving, a part interest. Hull sanding device. 4,510,718, Cl. 51-170.0EB.
Eisele, Hermann; and Stein, Volkhard, to Robert Bosch GmbH. Fuel injection pump. 4,510,908, Cl. 123-449.000.
Eiteljorg, Harrison. Ski boot. 4,510,703, Cl. 36-119.000.
EKC Technology, Inc.: *See—*
Miller, Anne K. M.; and Mason, Richard, 4,511,038, Cl. 206-454.000.
El Paso Hydrocarbons Company: *See—*
Mehra, Yuv R., 4,511,381, Cl. 62-17.000.
el Din Nasser, Gamal, to D.V.T. Buro fur Anwendung Deutscher Verfahrenstechnik H. Morsy. Apparatus for the desalination of sea water. 4,511,436, Cl. 202-174.000.
Electric Power Research Institute, Inc.: *See—*
Steininger, David A., 4,511,407, Cl. 134-1.000.
Electro-Hydraulic Controls, Inc.: *See—*
Presley, Glen T.; and Lautzenhiser, Lloyd L., 4,510,963, Cl. 137-117.000.
Electroline Manufacturing Company: *See—*
Elinsky, Howard S., 4,511,047, Cl. 211-90.000.
Elf France: *See—*
Denis, Jacques; Sillion, Bernard; Damin, Bernard; and Leger, Robert, 4,511,369, Cl. 44-62.000.
Elinsky, Howard S., to Electroline Manufacturing Company. Product display and storage shelf system. 4,511,047, Cl. 211-90.000.
Ellert, Roger H., to B-Bar-B, Inc. Machine and method for filling flexible containers. 4,510,737, Cl. 53-570.000.
Ellingson, David I.; and Wilson, James D., to Maytag Company, The. Control system for an access door. 4,510,777, Cl. 68-12.00R.
Elliott, Robert D.: *See—*
Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,511,721, Cl. 546-308.000.
Ellis, Bryan E., to SSP Pumps Limited. Positive displacement pumps. 4,511,316, Cl. 418-150.000.
Ellsworth, James G.: *See—*
Witalka, Jerome J.; Buettner, Howard L.; and Ellsworth, James G., 4,511,967, Cl. 364-200.000.
Elphick, Thomas G.; Eshleman, Edgar S.; and Field, Martin J., to General Motors Corporation. Fuel rail assembly. 4,510,909, Cl. 123-470.000.
Elsenbaumer, Ronald L.: *See—*
Frommer, Jane E.; Elsenbaumer, Ronald L.; and Davidson, Douglass S., 4,511,494, Cl. 252-518.000.
Elsis, Christopher C. Children's game pool. 4,510,632, Cl. 4-488.000.
Ely, Donald A., to Beloit Corporation. Dryer felt run. 4,510,698, Cl. 34-117.000.
Emhart Industries, Inc.: *See—*
Shedigian, Vandos, 4,511,949, Cl. 361-319.000.
Ems-Inventa AG: *See—*
Schmid, Eduard; and Hoppe, Manfred, 4,511,684, Cl. 524-101.000.
Emura, Noriaki: *See—*
Ariyoshi, Takashi; Emura, Noriaki; and Sakanaka, Yasuhiro, 4,511,679, Cl. 521-83.000.
Endo, Hiroshi: *See—*
Ishikawa, Yasuki; Endo, Hiroshi; Sone, Masazumi; and Imai, Iwao, 4,510,915, Cl. 123-620.000.
Endo, Toshiaki: *See—*
Yamazaki, Yasuhiro; and Endo, Toshiaki, 4,511,213, Cl. 358-261.000.
Energy Conversion Devices, Inc.: *See—*
Sapru, Krishna; Reichman, Benjamin; and Liang, Gao, 4,511,638, Cl. 429-111.000.
Eng, Benjamin, Jr., to John Fluke Mfg. Co., Inc. Bootstrap power regulator for systems such as analog to digital converters. 4,511,856, Cl. 330-297.000.
Engelbrecht & Lemmerbrock GmbH & Co.: *See—*
Hesse, Theodor; and Barkmeyer, Hans, 4,511,292, Cl. 406-152.000.
Enjoji, Susumu: *See—*
Sumino, Yoichi; and Enjoji, Susumu, 4,511,984, Cl. 364-415.000.
Enlow, William P.: *See—*
Hechenbleikner, Ingenuin; and Enlow, William P., 4,511,725, Cl. 548-530.000.
Ensign-Bickford Industries, Inc.: *See—*
Skutnik, Bolesh J., 4,511,209, Cl. 350-96.340.
Enviro-Spray Systems Incorporated: *See—*
Banks, Russell; and Magid, David J., 4,510,734, Cl. 53-449.000.
Eriksson, Bror A. Circuit arrangement for power control. 4,511,836, Cl. 323-300.000.
Eriksson, Hans. Oil-clearing element having two or more movable floating bodies. 4,511,285, Cl. 405-66.000.
Erlam, David P.; and Carr, Arthur E., to Rittal-Werk Rudolf Loh GmbH & Co. KG. Card frame with card guides and cards guided therein. 4,511,199, Cl. 339-45.00M.
Ermital AG: *See—*
Jovy, Herbert; and Schuster, Wilhelm, 4,510,629, Cl. 4-332.000.
Ernst, Hans-Otto; and Rohling, Wilhelm, to Westfalische Metall Industrie KG Hueck & Co. Vehicle headlight. 4,511,955, Cl. 362-347.000.
Erwin Kampf GmbH & Co., Firma: *See—*
Kuhlmann, Heinz; and Prinz, Eckhard, 4,511,419, Cl. 156-272.600.
Erwin Sick GmbH Optik-Elektronik: *See—*
Ross, Dieter; and Ostertag, Klaus, 4,511,803, Cl. 250-563.000.
ESA, Inc.: *See—*
Matson, Wayne R., 4,511,659, Cl. 436-150.000.
Eshleman, Edgar S.: *See—*
Elphick, Thomas G.; Eshleman, Edgar S.; and Field, Martin J., 4,510,909, Cl. 123-470.000.
Espinoza, Cesar, to Hollingsead International, Inc. Cable clamp assembly. 4,510,650, Cl. 24-16.0PB.
Espiritu Santo, Eugenio; Baxter, Kenneth D.; and Bluem, Gary R., to Deere & Company. Snap-in force sensor with bellows. 4,510,814, Cl. 73-862.570.
Estes, Donald C., to Speedco, Incorporated. Apparatus for distributing powdered material. 4,510,883, Cl. 118-305.000.
Eszakmagyarorszagi Vegyimuvek: *See—*
Mogyorodi, Ferenc; Koppany, Eniko; Bodi, Tibor; Balogh, Karoly; Toth, Istvan; Bognar, Rezso; Makleit, Sandor; Litkei, Gyorgy; Rakosi, Miklos; and Dinya, Zoltan, 4,511,736, Cl. 564-214.000.
Etablissements les Fils d'Auguste Chomarat & Cie: *See—*
Curinier, Jean; and Pinet, Philippe, 4,510,657, Cl. 28-100.000.
Ethicon, Inc.: *See—*
Alpern, Marvin, 4,511,035, Cl. 206-363.000.
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,511,706, Cl. 528-192.000.
Ethyl Corporation: *See—*
Knapp, Gordon G., 4,511,367, Cl. 44-53.000.
Knapp, Gordon G., 4,511,368, Cl. 44-53.000.
Shin, Kju H., 4,511,716, Cl. 544-277.000.
Smith, R. Scott; and Smith, Gerald Z., Jr., 4,511,753, Cl. 585-856.000.
Stahly, G. Patrick; and Stahly, Barbara C., 4,511,729, Cl. 560-020.000.
Ethyl Petroleum Additives, Inc.: *See—*
Burrows, Aubrey L.; Mabley, Paul B.; and Field, Steven J., 4,511,366, Cl. 44-53.000.
Eto, Yoshiyuki, to Nissan Motor Co., Ltd. Catalyst for reforming of methanol and process of preparing same. 4,511,673, Cl. 502-525.000.
Ets. Y. Jouanel S.A.: *See—*
Trioueleyre, Jean; Rousselin, Jean; Schmit, Patrick; and Gondry, Philippe, 4,510,785, Cl. 72-323.000.
Evans, Harmon A.: *See—*
Kwon, Young J.; and Evans, Harmon A., 4,511,399, Cl. 75-84.500.
Evans, Robert E., to S & S Corporation. Battery latch. 4,511,637, Cl. 429-100.000.
Evason, John; Rigby, Malcolm J.; and Ward, Peter, to Pilkington Brothers P.L.C. Thermally toughening glass. 4,511,384, Cl. 65-114.000.
Everitt, Delmar K.: *See—*
Goldfarb, Adolph E.; Everitt, Delmar K.; and Burger, Norman J., 4,511,343, Cl. 446-463.000.
Ex-Cell-O Corporation: *See—*
Gill, John D., 4,510,881, Cl. 114-270.000.
Expert Maschinenbau GmbH: *See—*
Moller, Reinfried, 4,511,110, Cl. 248-421.000.
Exploration Logging, Inc.: *See—*
Wisniewski, Waldemar S., 4,511,829, Cl. 318-317.000.
Exxon Production Research Co.: *See—*
Valencia, Jaime A.; and Denton, Robert D., 4,511,382, Cl. 62-20.000.
Exxon Research and Engineering Co.: *See—*
Fiocco, Robert J.; and Bushnell, James D., 4,511,537, Cl. 422-256.000.
Fuller, Everett J.; and Lundberg, Robert D., 4,511,479, Cl. 210-708.000.
Peiffer, Dennis G.; Lundberg, Robert D.; and Walker, Thad O., 4,510,998, Cl. 166-295.000.
F. L. Smidth & Co.: *See—*
Folsberg, Jan, 4,511,462, Cl. 209-140.000.
F. LLI Marzoli & C. S.P.A.: *See—*
Locatelli, Claudio; and Dragagna, Claudio, 4,510,646, Cl. 19-80.00R.
Fabralloy, Inc.: *See—*
Wilt, Henry E.; and Murray, Larry N., 4,511,088, Cl. 239-455.000.
Fabris, Hubert J.: *See—*
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., 4,511,699, Cl. 525-205.000.
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., 4,511,700, Cl. 525-283.000.
Fag Kugelfischer Georg Schafer & Co.: *See—*
Dittner, Adam; Schurr, Heinrich; and Von Wallenberg, Ducius, 4,511,971, Cl. 364-426.000.
Fage, Bonnard. Theatrical light box. 4,511,953, Cl. 362-230.000.

Fairchild Camera and Instrument Corporation: *See—*
Nagy, Alex; and Herlein, Dick, 4,511,846, Cl. 328-164.000.
Falcoff, Allan F.; Mikkelsen, Eric; and Rodrigues, Allan B. J., to Du Pont de Nemours, E. I., and Company. Apparatus and process for measuring the color of paints. 4,511,251, Cl. 356-246.000.
Fanelli, Noel. Water bicycle and detachable device therefor. 4,511,338, Cl. 440-26.000.
Fanuc Ltd: *See—*
Inaba, Hajimu; and Sakakibara, Shinsuke, 4,511,985, Cl. 364-513.000.
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Miyata, Mitsuto, 4,511,975, Cl. 364-474.000.
Farha, Floyd E., Jr.: *See—*
Reed, Larry E.; Porter, Randall A.; Farha, Floyd E., Jr.; and Guillory, Jack P., 4,511,405, Cl. 106-15.050.
Farmitalia Carlo Erba S.p.A.: *See—*
Ribaldone, Giuseppe; Felicioli, Maria G.; Santini, Claudio; and Agnes, Giovanni, 4,511,718, Cl. 544-406.000.
Farquharson, Graeme J.: *See—*
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; and Farquharson, Graeme J., 4,511,391, Cl. 71-88.000.
Farran, John; Hatchett, Michael R.; and Heath, John S., to International Business Machines Corporation. Mechanism for cutting single thickness paper or like sheet material and apparatus including such mechanism. 4,510,841, Cl. 83-176.000.
Fauconnier, William R.: *See—*
North, Henry; and Fauconnier, William R., 4,511,092, Cl. 241-49.000.
North, Henry; and Fauconnier, William R., 4,511,254, Cl. 366-118.000.
Faulring, Gloria M., to Union Carbide Corporation. Production of tool steels using chemically prepared V_2O_3 as a vanadium additive. 4,511,400, Cl. 75-129.000.
Faust, Uwe: *See—*
Heck, Gunter; Lienerth, Aladar; Malow, Egon; Schwarz, Karl-Heinz; and Faust, Uwe, 4,511,437, Cl. 203-19.000.
Faust, Valerie F. Herbal hair treatment compositions. 4,511,555, Cl. 424-74.000.
Fechner, Erno H., to Ampex Corporation. Damage control apparatus for magnetic tape transport. 4,511,943, Cl. 360-130.230.
Fedde, George A.; and Kirk, Kenneth H., to Sperry Corporation. Force assembler apparatus for robots. 4,510,683, Cl. 29-701.000.
Federal Signal Corporation: *See—*
Stanuch, Edward S., 4,511,880, Cl. 340-84.000.
Federighi, Frank F.: *See—*
Federighi, James L.; and Federighi, Frank F., 4,511,258, Cl. 366-337.000.
Federighi, James L.; and Federighi, Frank F., to Koflo Corporation. Static material mixing apparatus. 4,511,258, Cl. 366-337.000.
Feinstone, Stephen M.: *See—*
Purcell, Robert H.; and Feinstone, Stephen M., 4,511,556, Cl. 514-743.000.
Felicioli, Maria G.: *See—*
Ribaldone, Giuseppe; Felicioli, Maria G.; Santini, Claudio; and Agnes, Giovanni, 4,511,718, Cl. 544-406.000.
Felix, Raymond A., to Stauffer Chemical Co. Substituted benzyloxy chloroethoxy ethane herbicide antidotes. 4,511,394, Cl. 71-105.000.
Fencsik, Gabor; and Glenn, Fletcher M., II, to MDS-Qantel, Inc. Communication channel interface unit. 4,511,968, Cl. 364-200.000.
Feng, Ching C., to Dunegan Corporation. Apparatus for acoustic emission detection including a waveguide made of aluminum or beryllium oxide. 4,510,812, Cl. 73-644.000.
Ferguson, Blake L.; and Moracz, Donald J., to TRW Inc. Method of forging a workpiece. 4,510,788, Cl. 72-377.000.
Ferguson, Robert W.; Andors, Derik K.; and Crossman, William W., Jr., to Vermont Castings, Inc. Woodburning heating apparatus. 4,510,918, Cl. 126-79.000.
Ferraro, Charlotte L. Artificial nail mounting, reinforcement, and method. 4,511,608, Cl. 428-15.000.
Ferrero S.p.A.: *See—*
Cillario, Lorenzo, 4,510,735, Cl. 53-464.000.
Ferton, Daniel; and Mace, Robert, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Process for improving both fatigue strength and toughness of high-strength Al alloys. 4,511,409, Cl. 148-2.000.
Fetter, Stephen M., to Allis-Chalmers Corp. Suspension and sealing of latticework and filters. 4,511,380, Cl. 55-355.000.
Fichtel & Sachs Ag: *See—*
Dluhosch, Kurt, 4,510,739, Cl. 56-17.500.
Fidi, Werner; and Nawrata, Gunter, to AKG Akustische u.Kino-Gerate Gesellschaft m.b.H. Stylus for stereo pickups. 4,512,009, Cl. 369-170.000.
Field, Martin J.: *See—*
Elphick, Thomas G.; Eshleman, Edgar S.; and Field, Martin J., 4,510,909, Cl. 123-470.000.
Field, Steven J.: *See—*
Burrows, Aubrey L.; Mabley, Paul B.; and Field, Steven J., 4,511,366, Cl. 44-53.000.
Fielding, Verl: *See—*
Galloway, Donald, 4,511,155, Cl. 280-204.000.
Fields, Ellis K., to Standard Oil Company (Indiana). Carbamates of beta-hydroxyethylsulfoxides. 4,511,730, Cl. 560-033.000.
Figge, Dieter: *See—*
Artz, Gerd; Figge, Dieter; and Philipp, Clemens, 4,510,990, Cl. 164-431.000.
Filges, Ralf: *See—*
Klotmann, Fred; and Filges, Ralf, 4,511,266, Cl. 384-441.000.
Fillion, Jean-Claude, to S.N.E.C.M.A. Device for measurement of amplitude and angular position of an untrue running in a revolving system. 4,510,809, Cl. 73-457.000.
Fink, David: *See—*
Nazem, Faramarz; Didchenko, Rostislav; and Fink, David, 4,511,625, Cl. 428-401.000.
Finley, Joseph H.: *See—*
Lee, Fui-Tseng H.; Juelke, Charles V.; and Finley, Joseph H., 4,511,498, Cl. 252-609.000.
Fiocco, Robert J.; and Bushnell, James D., to Exxon Research and Engineering Co. Extraction zone. 4,511,537, Cl. 422-256.000.
Fiore, Louis T., to Radionics, Inc. Long range wireless alarm monitoring system. 4,511,887, Cl. 340-539.000.
Firestone Tire & Rubber Company, The: *See—*
Kang, Jung W.; and Davis, James A., 4,511,628, Cl. 428-457.000.
Firex Corporation: *See—*
Atwater, Richard G., 4,511,889, Cl. 340-629.000.
Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Circumferentially continuous cylinder for a rotary printing machine. 4,510,868, Cl. 101-415.100.
Fitch, John L.; and Mullins, Lynn D., to Mobil Oil Corporation. Solvent flooding to recover viscous oils. 4,510,997, Cl. 166-263.000.
Fitzwater, Margaret; and Keller, Lewis C., to Frito-Lay, Inc. Potato product with opposite phase-shifted corrugations of the same frequency and amplitude. 4,511,586, Cl. 426-144.000.
Florence, Robert A., to General Electric Company. Method for isolating ionomers in the salt form. 4,511,712, Cl. 528-488.000.
Flot, Regis; and Hine, Jean Patrick, to Raychem Corporation. Wire stripping arrangement. 4,510,827, Cl. 81-9.400.
FMC Corporation: *See—*
Bunnelle, Philip R., 4,510,971, Cl. 137-615.000.
Jennings, Charles E.; Barrington, Claud C.; Chen, Lien-Yan; Hopkins, Bob C.; McIntyre, John N.; and Regitz, Alfred P., 4,510,960, Cl. 137-75.000.
Lee, Fui-Tseng H.; Juelke, Charles V.; and Finley, Joseph H., 4,511,498, Cl. 252-609.000.
Fogel, Seymour; Welch, Juliet W.; and Karin, Michael, to University of California, The Regents of the. High efficiency eukaryotic metallothionein promoter system. 4,511,652, Cl. 435-29.000.
Fohrenkamm, Elsie A.; and Rousseau, Alan D., to Minnesota Mining and Manufacturing Company. Ethylenically-unsaturated dextrin composition for preparing a durable hydrophilic photopolymer. 4,511,646, Cl. 430-283.000.
Folsberg, Jan, to F. L. Smidth & Co. Method and apparatus for sorting particulate material. 4,511,462, Cl. 209-140.000.
Ford Motor Company: *See—*
McCabe, Graham, 4,511,277, Cl. 403-140.000.
Nielsen, Arnold D., 4,511,945, Cl. 361-154.000.
Rahnke, Christian J., 4,510,754, Cl. 60-602.000.
Forgey, James; and Kirk, Donald, Jr., to Hamlin International Corp. Method and apparatus for scrambling and descrambling video signals in a multichannel system. 4,511,919, Cl. 358-120.000.
Formflo Limited: *See—*
Holt, Peter J., 4,510,781, Cl. 72-105.000.
Forrest, Stephen R.; Kaplan, Martin L.; Schmidt, Paul H.; and Venkatesan, Thirumalai N. C., to AT&T Bell Laboratories. Process of enhancing conductivity of material. 4,511,445, Cl. 204-158.0HE.
Forsberg, Lennart G. Device used in connection with containers for bulk material. 4,511,066, Cl. 222-189.000.
Forsell, Kenneth A., to Eaton Corporation. Current limiting contact arrangement. 4,511,774, Cl. 200-147.00R.
Forster, Karl-Heinz; Schuck, Helmut; Johne, Hans; and Jentzsch, Arndt, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Control system for ink zone adjusters. 4,510,867, Cl. 101-365.000.
Fortunato, Alfred R.; Millard, Maurice; and Trzeciak, John R., to Singer Company, The. Simplified hardware component inter-connection system for generating a visual representation of an illuminated area in a flight simulator. 4,511,337, Cl. 434-43.000.
Foster, James E., to Universal Instruments Corporation. Method and apparatus for straightening and aligning leads and testing electrical functioning of components. 4,510,686, Cl. 29-838.000.
Foster, Ronald L. Tobacco harvester. 4,510,740, Cl. 56-27.500.
Foundation Merieux: *See—*
Play, Dominique; Bonneau, Marc; Merieux, Charles; Herbage, Daniel; and Comte, Philippe, 4,511,653, Cl. 435-69.000.
Fourcin, Adrian J.; Howard, David M.; and Walliker, John R., to National Research Development Corporation. Apparatus for the electrical stimulation of nerves. 4,510,936, Cl. 128-419.00R.
Fournier, Paul J. E., to Aeroquip Corporation. Self-reinforced face seal. 4,511,152, Cl. 277-207.00A.
Fowles, Thomas A.; Slater, Glenn L.; and Winchell, David A., to Baxter Travenol Laboratories, Inc. Method of making a bottle closure. 4,511,529, Cl. 264-515.000.
Fox, Daniel W.; Peters, Edward N.; and Smith, Gary F., to General Electric Company. Polycarbonate/addition polymer blends. 4,511,693, Cl. 525-67.000.
Franc, Zdenek: *See—*
Bulaty, Paul; De Mesmaeker, Ivan; Franc, Zdenek; and Salerno, Giuseppe, 4,511,839, Cl. 324-127.000.
Franco, Lila K.: *See—*
deCelle, Charles W., 4,510,913, Cl. 123-557.000.
Franco, Ralph A.: *See—*
deCelle, Charles W., 4,510,913, Cl. 123-557.000.

Franetzki, Manfred; and Prestele, Karl, to Siemens Aktiengesellschaft. Infusion device intended for implantation in a living body. 4,511,355, Cl. 604-131.000.

Frank, Xaver, to S & F Orthopadietechnik GmbH. Resilient support foot for walking aids, particularly crutches. 4,510,957, Cl. 135-84.000.

Frankel, Robert S.; and Herman, Alexander, to United States of America, Energy. Increasing capacity of baseband digital data communication networks. 4,512,025, Cl. 375-36.000.

Fraser, Howard H., Jr.; and Anderson, George A., III, to Carrier Corporation. Mounting for a hermetic compressor. 4,511,314, Cl. 417-363.000.

Freeman, Norman H.: *See—*
Hammond, Leslie A.; and Freeman, Norman H., 4,510,856, Cl. 99-457.000.

Freeman, Walter. Aviator eyeglasses. 4,511,226, Cl. 351-57.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Artz, Gerd; Figge, Dieter; and Philipp, Clemens, 4,510,990, Cl. 164-431.000.

Friedland, David J.: *See—*
Saprokhin, Alexander M.; Friedland, David J.; Baran, Richard M.; Kim, Jung T.; and McCurry, Lynn E., 4,511,440, Cl. 204-60.000.

Friedrich, Ralph S.: *See—*
Magarian, Gerald M.; and Friedrich, Ralph S., 4,511,423, Cl. 156-425.000.

Friesz, Robert E., to Murnan, Leo R.; and Omaha Door Company, part interest to each. Method of installing multi-sections vertically acting doors. 4,510,663, Cl. 29-429.000.

Frito-Lay, Inc.: *See—*
Fitzwater, Margaret; and Keller, Lewis C., 4,511,586, Cl. 426-144.000.

Fritz, Bernd, to ITT Industries, Inc. Electro-optical display device and method for its production. 4,511,218, Cl. 350-356.000.

Fritz, Raimund; and Zeyher, Fritz, to Heckler & Koch GmbH. Electronic firing mechanism for weapons. 4,510,844, Cl. 89-135.000.

Frommer, Jane E.; Elsenbaumer, Ronald L.; and Davidson, Douglass S., to Allied Corporation. Solution of a chalcogen-containing polymer and process of forming conducting polymer articles therefrom. 4,511,494, Cl. 252-518.000.

Froning, Edward C.; and Graham, Gregory S., to Froning, Edward C. Cannula, obturator, stylet and needle hub connectors for lumbar disc puncture. 4,511,356, Cl. 604-164.000.

Frosch, Hans: *See—*
Rommen, Hans; and Frosch, Hans, 4,510,783, Cl. 72-200.000.

Frungel, Frank; and Rohr, Jurgen. Microprocessor-driven laser ceilometers. 4,511,249, Cl. 356-5.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Makita, Fujio, 4,511,014, Cl. 180-233.000.
Sakakiyama, Ryuzo, 4,510,903, Cl. 123-339.000.
Sakakiyama, Ryuzo, 4,510,903, Cl. 123-339.000.

Fuji Photo Film Co.: *See—*
Anonuma, Masashi; Tamai, Yasuo; Sato, Tsunehiko; Funabashi, Shinichi; and Ogawa, Hiroshi, 4,511,484, Cl. 252-62.540.

Fuji Photo Film Co., Ltd.: *See—*
Hirai, Hiroyuki; and Kawata, Ken, 4,511,650, Cl. 430-559.000.
Hirano, Tsumoru; Yagihara, Morio; and Umemoto, Makoto, 4,511,647, Cl. 430-381.000.
Koike, Mitsuru; Kobayashi, Kesanao; Toyama, Tadao; Misu, Hiroshi; Tamoto, Koji; and Iwasaki, Masayuki, 4,511,645, Cl. 430-276.000.
Konaya, Yoshikazu, 4,511,098, Cl. 242-56.00R.
Nagao, Makoto; and Nahara, Akira, 4,511,635, Cl. 428-694.000.
Ogawa, Akira; and Tsuda, Momotoshi, 4,511,649, Cl. 430-553.000.
Okamura, Hisashi; Sakaguchi, Shinji; Takahashi, Osamu; and Murai, Ashita, 4,511,644, Cl. 430-219.000.
Teraoka, Masanori, 4,511,802, Cl. 250-484.100.
Toya, Ichizo, 4,511,643, Cl. 430-212.000.
Yanai, Akio; and Shirahata, Ryuji, 4,511,594, Cl. 427-38.000.

Fuji Xerox Co., Ltd.: *See—*
Ozawa, Takashi, 4,511,804, Cl. 250-578.000.

Fujie, Hideo: *See—*
Sekizawa, Hidekazu; Iwamoto, Akito; Togashi, Kousaku; and Fujie, Hideo, 4,510,866, Cl. 101-365.000.

Fujii, Shosaku, to Alps Electric Co., Ltd. Slider arrangement and method of producing of the same. 4,511,879, Cl. 338-174.000.

Fujii, Susumu: *See—*
Nozue, Ikutoshi; Fujii, Susumu; and Hanada, Masayuki, 4,511,668, Cl. 502-84.000.

Fujimoto, Kazuhisa: *See—*
Tomita, Fusao; Tamaoki, Tatsuya; Shirahata, Kunikatsu; Iida, Takao; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,511,560, Cl. 514-27.000.

Fujimoto, Ryo, to Canon Kabushiki Kaisha. Method and device for correcting chrominance signal. 4,511,916, Cl. 358-28.000.

Fujimoto, Terunori; Shimizu, Nobuyoshi; Shimizu, Mutsuhiro; Yanagihara, Kazunori; Miyachi, Akio; and Inui, Tsuneo, to Toyo Kohan Co., Ltd. Metallic chromium-nickel-hydrated chromium oxide-coated tin free steel and process for the production thereof. 4,511,631, Cl. 428-632.000.

Fujisawa, Ikuo: *See—*
Nishikawa, Hisashi; Suzuki, Satoshi; Hirata, Masanobu; Sakamoto, Koichiro; Fujisawa, Ikuo; and Takeno, Shozo, 4,511,877, Cl. 338-2.000.

Fujisawa, Makoto: *See—*
Kano , Yoshiharu; Fujisawa, Makoto; Nojiri, Shoji; and Tanaka, Yoshikazu, 4,512,015, Cl. 370-110.100.

Fujita, Fumio: *See—*
Shimomura, Takatoshi; Fujita, Fumio; and Hirakawa, Manabu, 4,511,711, Cl. 528-489.000.

Fujita, Toshihito: *See—*
Ideno, Eizo; Fukushi, Shinichi; Tai, Masahiko; Nakazawa, Koji; and Fujita, Toshihito, 4,511,095, Cl. 242-18.00G.

Fujita, Tsutomu: *See—*
Ida, Jinsei; Fujita, Tsutomu; Yamada, Ichiho; Higuchi, Fumio; and Matsuo, Kenzaburo, 4,510,669, Cl. 29-568.000.

Fujitsu Fanuc Limited: *See—*
Kurakake, Mitsuo, 4,511,982, Cl. 364-167.000.

Fujitsu Limited: *See—*
Kano , Yoshiharu; Fujisawa, Makoto; Nojiri, Shoji; and Tanaka, Yoshikazu, 4,512,015, Cl. 370-110.100.
Kasai, Yoshihiko, 4,511,202, Cl. 333-189.000.
Nozaki, Shigeki; Takemae, Yoshihiro; and Nakano, Tomio, 4,511,997, Cl. 365-189.000.
Sampei, Takeshi; Miyahara, Norio; Nikaido, Tadanobu; Sato, Hiroaki; and Aoyama, Keizo, 4,512,012, Cl. 370-66.000.

Fukatsu, Yoshiaki: *See—*
Kakino, Shigeru; Hattori, Katsuhide; Fukatsu, Yoshiaki; Moriyama, Hideo; and Sakakibara, Hidekazu, 4,511,412, Cl. 149-109.600.

Fukaya, Hiroyasu: *See—*
Ninomiya, Masakazu; Suda, Toshi; Omori, Norio; Akiyama, Susumu; and Fukaya, Hiroyasu, 4,510,910, Cl. 123-486.000.

Fukuchi, Hiromichi, to NEC Corporation. Color ink-jet printer. 4,511,907, Cl. 346-140.00R.

Fukuda, Shinichiro, to Shaken Co., Ltd. Method of storing images in the form of contours and photo-typesetting apparatus thereof. 4,511,893, Cl. 340-747.000.

Fukushi, Shinichi: *See—*
Ideno, Eizo; Fukushi, Shinichi; Tai, Masahiko; Nakazawa, Koji; and Fujita, Toshihito, 4,511,095, Cl. 242-18.00G.

Fukuta, Masaru, to Motorola, Inc. High speed presettable counter. 4,512,030, Cl. 377-107.000.

Fukuura, Yukio: *See—*
Tanuma, Itsuo; Takeichi, Hideo; Fukuura, Yukio; Ohyachi, Tomio; and Naito, Kazuo, 4,511,627, Cl. 428-429.000.

Fulcomer, Emanuel J., Jr.; Nici, Richard J.; Poteat, Vance E.; Schramm, George W.; Sharp, John B.; and Winseck, Michael M., Jr., to AT&T Information Systems Inc. Digital communication station signaling control. 4,512,016, Cl. 370-110.100.

Fuller, Everett J.; and Lundberg, Robert D., to Exxon Research and Engineering Company. Oil removal from water suspensions using ionic domain polymers. 4,511,479, Cl. 210-708.000.

Fumagalli, Carlo: *See—*
Suciu, George D.; Stefani, Giancarlo; and Fumagalli, Carlo, 4,511,670, Cl. 502-209.000.

Funabashi, Shinichi: *See—*
Anonuma, Masashi; Tamai, Yasuo; Sato, Tsunehiko; Funabashi, Shinichi; and Ogawa, Hiroshi, 4,511,484, Cl. 252-62.540.

Funk, Gerhard, to Patelhold Patentverwertungs- & Elektro-Holding AG. Common bus access system using plural configuration tables for failure tolerant token passing among processors. 4,511,958, Cl. 364-200.000.

Funk, Richard J. One-piece clamp. 4,511,107, Cl. 248-74.100.

Furutsu, Akira, to Japan Bano'k Co., Ltd.; and Ben Clements & Sons, Inc. Fastener dispensing device. 4,511,073, Cl. 227-67.000.

G.D. Searle & Co.: *See—*
McCullagh, Keith G.; Wadsworth, Harry J.; and Hann, Michael M., 4,511,504, Cl. 260-112.50R.

G.D. Societa Per Azioni: *See—*
Seragnoli, Enzo, 4,511,045, Cl. 209-535.000.

GA Technologies Inc.: *See—*
Creedon, Richard L., 4,510,972, Cl. 137-625.280.

Gaal, Sandor: *See—*
Gorog, Katalin; Dudar, Erzebet; Gardi, Ivan; Kocsis, Maria; Gaal, Sandor; and Tasnadi, Marta, 4,511,714, Cl. 548-215.000.

Gaffney, Anne M., to Atlantic Richfield Company. Hydrocarbon dehydrogenation. 4,511,754, Cl. 585-656.000.

Gaia, Aldino J.: *See—*
Rasmussen, John F.; and Gaia, Aldino J., 4,511,874, Cl. 337-159.000.

Gaiser, Robert F., to Bendix Corporation, The. Master cylinder. 4,510,752, Cl. 60-562.000.

Gallaher, Kenneth R.: *See—*
Mott, Philip J.; and Gallaher, Kenneth R., 4,510,962, Cl. 137-102.000.

Gallay, Jean J.; and Schweizer, Ernst, to Ciba-Geigy Corporation. 6-[(4-Substituted piperazin-l-yl)thiocarbonylamino]benzazoles and their use. 4,511,567, Cl. 514-253.000.

Galloway, Donald, to Fielding, Verl. One wheel trailer for a two-wheeled vehicle. 4,511,155, Cl. 280-204.000.

Gamble, David E. Fuel system. 4,510,912, Cl. 123-525.000.

Gancy, Alan B. Nonpolluting salts and method of making same. 4,511,485, Cl. 252-70.000.

Gap Gesselschaft fuer Auswertungen und Patente AG: *See—*
Bossina, Jaap, 4,511,068, Cl. 222-257.000.

Garcia, Elmer D., to United States of America, Energy. Breathable gas distribution apparatus. 4,510,930, Cl. 128-202.220.

Gardi, Ivan: *See—*
Gorog, Katalin; Dudar, Erzebet; Gardi, Ivan; Kocsis, Maria; Gaal, Sandor; and Tasnadi, Marta, 4,511,714, Cl. 548-215.000.

Garley, Anthony M.; and Stafford, Rita A., to USM Corporation. Method for positioning two workpiece portions for stitching together along a desired stitching path. 4,510,876, Cl. 112-262.100.

Garlock, Inc.: *See—*
Parsons, William, Jr., 4,510,966, Cl. 137-375.000.

Garrett Corporation, The: *See—*
Graves, Richard F., 4,511,106, Cl. 248-65.000.

Gartmann, Russell J.; and Brown, James S., to Transamerica DeLaval Inc. Demineralization of feed water in a steam system. 4,510,755, Cl. 60-657.000.

Garwin, Richard L.; and Levine, James L., to International Business Machines Corporation. Force sensing data input device responding to the release of pressure force. 4,511,760, Cl. 178-18.000.

Gaspardo, Luigi. Stirrer-feeder for pneumatic distributors drills. 4,511,061, Cl. 221-200.000.

Gaur, Santosh P.: *See—*
Anantha, Narasipur G.; Gaur, Santosh P.; Huang, Yi-Shiou; and Tsang, Paul J., 4,510,676, Cl. 29-577.00C.

Gauri, Kailash K. Pharmaceutical composition. 4,511,557, Cl. 514-263.000.

Gauthier-Lafaye, Jean; Perron, Robert; and Doussain, Claude, to Rhone-Poulenc Chimie de Base. Carbonylation of methyl acetate. 4,511,517, Cl. 260-549.000.

Gazzera, Raymond W., to United States of America, Air Force. Pneumatic actuator device. 4,510,846, Cl. 91-460.000.

Gebruder Kommerling Kunststoffwerke GmbH: *See—*
Blaum, Franz, 4,511,323, Cl. 425-385.000.

Gebruder Loepfe AG: *See—*
Glockner, Rolf; and Stutz, Hansruedi, 4,511,253, Cl. 356-385.000.

Geczy, Bela A., to Smith International, Inc. Thrust and radial bearing assembly. 4,511,193, Cl. 384-611.000.

Gehl Company: *See—*
Campbell, Hallis D.; and Burrough, Donald E., 4,510,741, Cl. 56-341.000.

Gehrke, Glenn F.: *See—*
Hazebrook, Daniel W.; Gehrke, Glenn F.; and Schmidt, Michael J., 4,511,346, Cl. 464-146.000.

Geikas, George I.: *See—*
Greeson, Richard L.; and Geikas, George I., 4,511,614, Cl. 428-141.000.

Gellenbeck, Thomas C., to Team Cruiser Conversion Co., Inc. Truck cab with rear compartment and engine housing. 4,511,175, Cl. 296-190.000.

Genentech, Inc.: *See—*
Builder, Stuart E.; and Ogez, John R., 4,511,502, Cl. 260-112.00R.
Olson, Kenneth C.; and Pai, Rong-Chang, 4,511,503, Cl. 260-112.00R.

General Electric Company: *See—*
Bell, Robert K., 4,511,861, Cl. 331-108.00R.
Eaton, Richard H., 4,511,203, Cl. 339-255.00P.
Florence, Robert A., 4,511,712, Cl. 528-488.000.
Fox, Daniel W.; Peters, Edward N.; and Smith, Gary F., 4,511,693, Cl. 525-67.000.
Heft, Eldon B.; Huseby, Irvin C.; and Szymaszek, Jan W., 4,511,773, Cl. 200-144.00C.
Hofmann, Lee G.; and Dittmar, Charles J., Jr., 4,511,972, Cl. 364-434.000.
Johnson, Ronald L., 4,510,763, Cl. 62-115.000.
Kast, Howard B., 4,510,848, Cl. 91-461.000.
Miller, Edward B.; and Eichelberger, Charles W., 4,511,895, Cl. 340-825.500.
Miller, Timothy J. E.; Jones, Donald W.; and Kalan, Gary L., 4,510,680, Cl. 29-598.000.
Ryang, Hong-Son, 4,511,701, Cl. 525-533.000.
Schmidt, Lawrence R.; and Lovgren, Eric M., 4,511,535, Cl. 422-137.000.
Vandegraaf, Johannes J., 4,511,863, Cl. 332-18.000.

General Mills, Inc.: *See—*
Olson, Sharon; and Zoss, Robert, 4,511,583, Cl. 426-89.000.

General Motors Corporation: *See—*
Elphick, Thomas G.; Eshleman, Edgar S.; and Field, Martin J., 4,510,909, Cl. 123-470.000.
Rees, Richard W. A., 4,511,187, Cl. 308-3.800.

General Tire & Rubber Company, The: *See—*
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., 4,511,699, Cl. 525-205.000.
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., 4,511,700, Cl. 525-283.000.

Genetic Systems Corporation: *See—*
Nowinski, Robert C.; and Hoffman, Allan S., 4,511,478, Cl. 210-691.000.

Geo Vann, Inc.: *See—*
George, Flint R.; and Brieger, Emmet F., 4,510,999, Cl. 166-297.000.

Georg, Dennis D.; and Osecky, Benjamin D., to Hewlett-Packard Company. Dynamic physical memory mapping and management of independent programming environments. 4,511,964, Cl. 364-200.000.

George, Flint R.; and Brieger, Emmet F., to Geo Vann, Inc. Well cleanup and completion method and apparatus. 4,510,999, Cl. 166-297.000.

Geosource Inc.: *See—*
Mayne, W. Harry; and Zilkha, Sasson, 4,512,001, Cl. 367-189.000.

Gerard, Frank. Permanent magnet thermal energy system. 4,511,777, Cl. 219-10.510.

Geria, Navin; and Shin, Chung T., to Bristol-Myers Company. Non-staining antiperspirant stick composition. 4,511,554, Cl. 424-65.000.

German, Martin A.; and Volk, Joseph F., to Warner & Swasey Co., The. Grinding machine having improved dressing means. 4,510,716, Cl. 51-5.00D.

Gessell, Donald E., to Du Pont de Nemours, E. I., and Company. High efficiency catalysts for varying olefin polymer molecular weight distribution. 4,511,669, Cl. 502-110.000.

Ghosh, Hitendra; Murgai, Ashok; and Westdorp, Wolfgang A., to International Business Machines Corporation. Method of controlling oxygen content and distribution in grown silicon crystals. 4,511,428, Cl. 156-601.000.

Gidick, Ward F., to Raymond Kaiser Engineers Inc. Method for installation of an extended header. 4,510,959, Cl. 137-15.000.

Giguere, Jean P., to Donat Flamand Inc. Composite weather strip for windows and doors. 4,510,715, Cl. 49-488.000.

Gikas, Giorgos X., to Gillette Company, The. Hair treating article and a method of its use. 4,510,952, Cl. 132-37.00R.

Giles, Michael K.; and Rogers, Robert B., to United States of America, Air Force. Kalman filter preprocessor. 4,511,219, Cl. 350-388.000.

Gill, John D., to Ex-Cell-O Corporation. Marine propulsion unit. 4,510,881, Cl. 114-270.000.

Gillette Company, The: *See—*
Gikas, Giorgos X., 4,510,952, Cl. 132-37.00R.
Trotta, Robert A., 4,511,273, Cl. 401-260.000.

Ginter, Sally P.: *See—*
Termine, Enrico J.; and Ginter, Sally P., 4,511,688, Cl. 524-380.000.

Girard, Leroy. Ornamental assembly. 4,510,707, Cl. 40-152.000.

GKN Automotive Components, Inc.: *See—*
Hazebrook, Daniel W.; Gehrke, Glenn F.; and Schmidt, Michael J., 4,511,346, Cl. 464-146.000.

GKSS-Forschungszentrum-Geesthacht GmbH: *See—*
Luther, Gunter; Loebel, Peter; Risse, Gerhard; and Leiser, Volker, 4,510,932, Cl. 128-204.290.

Glanz, James: *See—*
Motley, Robert W.; and Glanz, James, 4,511,782, Cl. 219-121.00P.

Glauberman, Gisela: *See—*
Kreuzer, Franz-Heinrich; Glauberman, Gisela; and Bosch, Erhard, 4,511,728, Cl. 556-419.000.

Glaverbel: *See—*
Duchene, Eloi; and Laroche, Pierre, 4,511,618, Cl. 428-215.000.

Glaze, Stanley G.: *See—*
Thomas, Alan; and Glaze, Stanley G., 4,511,022, Cl. 188-299.000.

Glenn, Fletcher M., II: *See—*
Fencsik, Gabor; and Glenn, Fletcher M., II, 4,511,968, Cl. 364-200.000.

Glenn, Robert L., to Eaton Corporation. Right-angle electrical clamping connector. 4,511,204, Cl. 339-263.00R.

Global Marine, Inc.: *See—*
Horton, Edward E., 4,511,287, Cl. 405-204.000.
Wetmore, Sherman B., 4,511,288, Cl. 405-217.000.

Glock, Alfred, to SKF Kugellagerfabriken GmbH. Construction of draw frames for spinning machines. 4,510,645, Cl. 19-0.250.

Glockner, Rolf; and Stutz, Hansruedi, to Gebruder Loepfe AG. Device for measuring the transverse dimension of a thread. 4,511,253, Cl. 356-385.000.

Gnacinski, Leonard T.: *See—*
Moore, Benson R.; and Gnacinski, Leonard T., 4,511,347, Cl. 474-43.000.

GNB Batteries Inc.: *See—*
Sabatino, Anthony; Schaumburg, Edward G.; Recht, Peter A.; Olszewski, Douglas J.; and Strait, Richard T., 4,510,682, Cl. 29-623.100.

Goddard, Robert M. Parallel access memory lighting system. 4,511,824, Cl. 315-297.000.

Godfrey, Steven W.; Stern, Allen M.; and MacGregor, Fran W., to Hunt Manufacturing Co. Portable keyboard support. 4,511,111, Cl. 248-459.000.

Goepel, Ernst: *See—*
Pohlig, Dietmar; and Goepel, Ernst, 4,511,797, Cl. 250-231.0SE.

Goessler, Gerhard; and Wilde, Eugen, to E.G.O. Elektro-Gerate Blanc u. Fischer. Heating element, particularly radiant heating element for heating glass ceramic plates. 4,511,789, Cl. 219-446.000.

Goffman, Martin; and Jordan, Thomas L., to ASARCO Incorporated. Method of thiourea addition to electrolytic solutions useful for copper refining. 4,511,443, Cl. 204-108.000.

Gohko, Nobuaki: *See—*
Tanaka, Toru; Gohko, Nobuaki; Kishiro, Osamu; and Murakami, Atsushi, 4,511,704, Cl. 526-125.000.

Goi, Koichi: *See—*
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,511,133, Cl. 271-3.100.

Goldberg, Ellen H., to University Patents, Inc. ATCC HB8116 And its monoclonal anti-H-Y antibody, Hyclonalan. 4,511,661, Cl. 436-503.000.

Golden, William G.: *See—*
Bellar, Robert J.; Golden, William G.; Saperstein, David D.; and Vats, Ashok, 4,511,986, Cl. 364-576.000.

Goldfarb, Adolph E.; Everitt, Delmar K.; and Burger, Norman J., to Everitt, Delmar K.; and Burger, Norman J. Wheeled miniature toy vehicle with easily selectable plural modes of use. 4,511,343, Cl. 446-463.000.

Gondry, Philippe: *See—*
Triouleyre, Jean; Rousselin, Jean; Schmit, Patrick; and Gondry, Philippe, 4,510,785, Cl. 72-323.000.

Gong, Cheng-Shung, to Purdue Research Foundation. Direct fermentation of D-xylose to ethanol by a xylose-fermenting yeast mutant. 4,511,656, Cl. 435-161.000.

Goodman, Jack E.: *See*—
Bennett, John T., Jr.; and Goodman, Jack E., 4,511,534, Cl. 422-100.000.
Goodrich, Lloyd E., Jr.; and Long, Robert A. Chucking accessory. 4,511,153, Cl. 279-2.00R.
Gorler, Klaus: *See*—
Madaus, Rolf; and Gorler, Klaus, 4,511,561, Cl. 424-195.100.
Gorog, Katalin; Dudar, Erzebet; Gardi, Ivan; Kocsis, Maria; Gaal, Sandor; and Tasnadi, Marta, to Nitrokemia Ipartelepek. Herbicidal antidote compositions. 4,511,714, Cl. 548-215.000.
Gottlieb, Michael M., to Rogers Corporation. Multilayer decoupling capacitor and method of manufacture thereof. 4,511,951, Cl. 361-433.000.
Gotz, Laslo, to Texas Instruments Incorporated. Method for tuning the input stage of a receiver to a desired receiving frequency and circuit arrangement for carrying out the method. 4,511,923, Cl. 358-191.100.
Grabbe, Dimitry G.; and Korsunsky, Iosif, to AMP Incorporated. High density contact assembly. 4,511,197, Cl. 339-17.0CF.
Grabner, Christian: *See*—
Klein, Wilhelm; Koske, Jorg; Herzog, Siegfried; Jordan, Hans-Peter; Bauer, Wilhelm; Bausch, Max; and Grabner, Christian, 4,511,214, Cl. 350-632.000.
Grady, Marilyn. Commode. 4,510,631, Cl. 4-478.000.
Graf, Raymond J., to Cincinnati Incorporated. Press brake having spring back compensation stroke reversal control. 4,511,976, Cl. 364-474.000.
Grafelmann, Hans L. Dental instrument for cutting slots for receiving implants into the jaw. 4,511,334, Cl. 433-165.000.
Graham, Gregory S.: *See*—
Froning, Edward C.; and Graham, Gregory S., 4,511,356, Cl. 604-164.000.
Graham, Merrill E., Jr. Heat engine. 4,510,757, Cl. 60-667.000.
Grainger, Alfred J. Drill bit and method of use thereof. 4,511,006, Cl. 175-57.000.
Grandvallet, Gilles: *See*—
Deborde, Albert H.; and Grandvallet, Gilles, 4,510,976, Cl. 139-435.000.
Grant, Ronald J.: *See*—
Drake, Cyril F.; Jones, Ronald; Bateson, Paul F.; Grant, Ronald J.; and Burrage, Martin E., 4,511,404, Cl. 106-14.120.
Grapha-Holding AG: *See*—
Muller, Hans, 4,511,132, Cl. 270-58.000.
Grasselli, R. K.: *See*—
Attig, T. G.; and Grasselli, R. K., 4,511,548, Cl. 423-376.000.
Graves, Richard F., to Garrett Corporation, The. Heat exchanger support system providing for thermal isolation and growth. 4,511,106, Cl. 248-65.000.
Gray, Laurence A., to Yale-New Haven Hospital, Inc. Brachytherapy devices and methods employing americium-241. 4,510,924, Cl. 128-1.200.
Gray Tool Company: *See*—
Adamek, Frank C.; Bonds, James V.; and Bridges, Charles D., 4,511,002, Cl. 166-382.000.
Green, Jerrold D.: *See*—
LaBarge, Robert L.; Horansky, Frank J.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,510,857, Cl. 100-53.000.
LaBarge, Robert L.; Pohlenz, Elmer E.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Scherf, Thomas W., 4,510,860, Cl. 100-49.000.
Green, Lawrence E.; and Morrish, William R. Theft-proof selectively positionable outdoor chair. 4,511,179, Cl. 297-349.000.
Green, Michael H.: *See*—
Wilson, William C.; and Green, Michael H., 4,511,297, Cl. 412-8.000.
Greene, Dennis T.; and Salyers, Glen M. Siding cutter. 4,510,834, Cl. 83-453.000.
Greene, George J. Liquid-gas contacting apparatus and pump therefor. 4,511,378, Cl. 55-208.000.
Greene & Kellogg, Inc.: *See*—
McCombs, Norman R., 4,511,377, Cl. 55-163.000.
Greenstein, Lawrence J.; and Yeh, Yu S., to AT&T Bell Laboratories. Technique for digital radio space diversity combining. 4,512,034, Cl. 455-139.000.
Greeson, Richard L.; and Geikas, George I., to Ball Corporation. Substrate having high absorptance and emittance black electroless nickel coating and a process for producing the same. 4,511,614, Cl. 428-141.000.
Gregoire, Daniel: *See*—
Bernuchon, Marc; Pompei, Michel; and Gregoire, Daniel, 4,511,126, Cl. 267-140.100.
Greve, Heinz; and Wahle, Gunter, to Hauni-Werke Korber & Co. KG. Apparatus for applying atomized liquid plasticizer to a running tow of filamentary filter material. 4,510,885, Cl. 118-674.000.
Grider, Bruce A., to B. F. Goodrich Company, The. Brake apparatus. 4,511,021, Cl. 188-218.0XL.
Griebel, Heinrich: *See*—
Kille, Ewald; and Griebel, Heinrich, 4,511,074, Cl. 227-113.000.
Griffis, Patrick D.; and Rindal, Abraham E., to RCA Corporation. Frequency translation phase-locked loop for separate or intercarrier type television sound detection. 4,511,924, Cl. 358-197.000.
Grigat, Ernst: *See*—
Niederdellmann, Georg; and Grigat, Ernst, 4,511,680, Cl. 521-49.500.
Griggs, Calvin: *See*—
Treace, Harry T.; and Griggs, Calvin, 4,510,627, Cl. 3-1.000.
Grigoleit Company, The: *See*—
Howie, Robert K., Jr., 4,510,666, Cl. 29-511.000.
Groothuis, Gerrit J.; de Haan, Atze; Poel, Hendrik; Tietjens, Eduard W.; and de Vries, Jochem J., to U.S. Philips Corporation. Shaving apparatus. 4,510,687, Cl. 30-34.200.
Grosser, Werner: *See*—
Bauer, Wolfgang; and Grosser, Werner, 4,510,821, Cl. 74-552.000.
Grothe, Steven P., to Sperry Corporation. Variable refresh rate for stroke CRT displays. 4,511,892, Cl. 340-739.000.
Grunbeck Wasseraufbereitung GmbH: *See*—
Arens, Hans, 4,510,978, Cl. 141-65.000.
Gruner, John. Identification and control apparatus, for example, for service personnel for a restaurant. 4,511,161, Cl. 283-1.00A.
Grunsky, Manfred; Sussmuth, Reiner; and Ischen, Gunter, to Stellram GmbH. Rotary material removing tool. 4,511,294, Cl. 408-232.000.
GTE Communication Systems Corporation: *See*—
Skidanenko, Constatine V.; and McGibbon, Gregor D., 4,511,763, Cl. 179-16.0AA.
GTE Valeron Corporation: *See*—
Cusack, Robert F., 4,510,693, Cl. 33-174.00L.
Guadagno, Philip A.; and Sanford, James R. M., to Helena Laboratories Corporation. Test kit for performing a medical test. 4,511,533, Cl. 422-61.000.
Guardian Fasteners and Closure Systems: *See*—
Marks, Milton, 4,510,826, Cl. 81-57.370.
Guerillot, Stephane: *See*—
Dureigne, Bernard; Guerillot, Stephane; and Regnault, Alain, 4,511,992, Cl. 364-825.000.
Guerrero, Manuel A., to Sony Corporation. Inertial tape positioning method and apparatus. 4,511,937, Cl. 360-72.100.
Guidry, Shelby L.; and DeCuir, Perry J., Sr., to Schlumberger Technology Corporation. Full-bore drill stem testing apparatus with surface pressure readout. 4,510,797, Cl. 73-151.000.
Guillory, Jack P.: *See*—
Reed, Larry E.; Porter, Randall A.; Farha, Floyd E., Jr.; and Guillory, Jack P., 4,511,405, Cl. 106-15.050.
Guilloteau, Rene , to Societe Generale pour les Techniques Nouvelles S.G.N. Rotary device for shearing a bundle of tubes containing burnt nuclear fuels. 4,510,832, Cl. 83-168.000.
Guilloteau, Rene , to Societe Generale pour les Techniques Nouvelles, S.G.N. Method and devices for producing exchanges in reservoirs used for storing radioactive materials. 4,511,500, Cl. 252-633.000.
Gulla, Michael: *See*—
Orio, Alfred P.; Levy, Leonard R.; and Gulla, Michael, 4,511,403, Cl. 106-1.220.
Gundel, Janos: *See*—
Benko, Pal; Ratz nee Simonek, Ildiko ; Pallos, Laszlo ; Magyar, Karoly; Kovacs, Jeno ; Matrai, Erzsebet; Gundel, Janos; and Balogh, Albert, 4,511,717, Cl. 544-353.000.
Gunderson, Steven J. Output following intermediate cascode circuit. 4,511,857, Cl. 330-311.000.
Gupta, Anil, to Seeq Technology, Inc. Charge pump for providing programming voltage to the word lines in a semiconductor memory array. 4,511,811, Cl. 307-463.000.
Gurries, Raymond A., to Resonant Technology Company. Pavement penetrating tool. 4,511,282, Cl. 404-90.000.
Guth, Jacob J.; and Verdicchio, Robert J., to Johnson & Johnson Baby Products Company. Detergent compounds and compositions. 4,511,513, Cl. 260-404.500.
Gutleber, Frank S., to United States of America, Army. Code compressor for multilevel interleaved multiplexed noise codes. 4,511,885, Cl. 340-347.0DD.
Gutleber, Frank S., to United States of America, Army. Impulse autocorrelation function communications system. 4,512,024, Cl. 375-34.000.
Guy, Theron M. P. J.: *See*—
Michel, Urien; and Guy, Theron M. P. J., 4,511,988, Cl. 364-717.000.
Gyles, Darrell D.: *See*—
Walsh, Richard J.; and Gyles, Darrell D., 4,511,046, Cl. 209-539.000.
H. H. Brown Shoe Co., Inc.: *See*—
Schour, Avi; and Bloch, Igal, 4,510,701, Cl. 36-68.000.
H. Krantz GmbH & Co.: *See*—
Richarts, Fritz, 4,510,762, Cl. 62-79.000.
Habeck, Reinhold; Mackiol, Norbert; Mautner, Franz; and Schwarzler, Peter, to Krauss-Maffei Aktiengesellschaft. Railroad vehicle bogie. 4,510,871, Cl. 105-167.000.
Haddad, Hussain A.: *See*—
Munson, Robert E.; and Haddad, Hussain A., 4,511,868, Cl. 333-257.000.
Hagen, Helmut; Markert, Juergen; Kohler, Rolf-Dieter; and Wuerzer, Bruno, to BASF Aktiengesellschaft. 3-Chloro-8-cyanoquinolines and their use for controlling undesirable plant growth. 4,511,393, Cl. 71-92.000.
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Digital processor with floating point multiplier and adder suitable for digital signal processing. 4,511,990, Cl. 364-748.000.
Haldor Topsoe A/S: *See*—
Pedersen, Karsten; Rostrup-Nielsen, Jens R.; and Jorgensen, Ib Greve H., 4,511,674, Cl. 518-714.000.
Hallmark Findings, Inc.: *See*—
Alley, Philip J.; and Ireland, Thomas R., 4,510,772, Cl. 63-12.000.

Halsted, Charles P.: *See—*
Connor, John T.; Halsted, Charles P.; and Ravn, Jacob, 4,511,044, Cl. 209-522.000.
Hamada, Osamu, to Sony Corporation. Digital signal processing system. 4,511,966, Cl. 364-200.000.
Hamisch, Paul H., Jr.; and Mistyurik, John D., to Monarch Marking Systems, Inc. Hand-held labeler. 4,511,422, Cl. 156-384.000.
Hamlin International Corp.: *See—*
Forgey, James; and Kirk, Donald, Jr., 4,511,919, Cl. 358-120.000.
Hammond, Leslie A.; and Freeman, Norman H., to Australian Dairy Corporation. Manufacture of Cheddar and like cheese. 4,510,856, Cl. 99-457.000.
Hana, Thomas C.: *See—*
Henrich, Kenneth J.; and Hana, Thomas C., 4,511,852, Cl. 330-252.000.
Hanada, Masayuki: *See—*
Nozue, Ikutoshi; Fujii, Susumu; and Hanada, Masayuki, 4,511,668, Cl. 502-84.000.
Handling Systems, Inc.: *See—*
Volakakis, John G.; McNelis, Robert L.; and Wallentin, Burt H., 4,511,048, Cl. 212-253.000.
Hane, Toshioki: *See—*
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,511,518, Cl. 260-543.00F.
Hann, Michael M.: *See—*
McCullagh, Keith G.; Wadsworth, Harry J.; and Hann, Michael M., 4,511,504, Cl. 260-112.50R.
Hanna, Thomas J.; Logsdon, Bill C.; and Meredith, Elmer E., to Hanna, Thomas J. Fishing lure. 4,510,710, Cl. 43-42.130.
Hans, Rudiger; and Brandenstein, Manfred, to SKF Kugellagerfabriken GmbH. Support for a tension roller. 4,511,192, Cl. 384-543.000.
Hansen, Erik; and Lambach, Heinrich W., to Brdr. Schur International A/S. Method and an apparatus for closing packing bags for slaughtered poultry. 4,510,733, Cl. 53-434.000.
Hara, Takafumi, to Sharp Kabushiki Kaisha. Ink liquid reservoir in an ink jet system printer. 4,511,906, Cl. 346-140.00R.
Harada, Mineo: *See—*
Takahashi, Kazue; Okuna, Kenzi; Nakajima, Isao; Harada, Mineo; and Kako, Yutaka, 4,511,269, Cl. 400-124.000.
Harbeke, Gunther; and Duffy, Michael T., to RCA Corporation. Optical reflectance method for determining the surface roughness of materials in semiconductor processing. 4,511,800, Cl. 250-372.000.
Hardacre, Nicholas P., to Leigh Flexible Structure Ltd. Flexible barriers. 4,511,286, Cl. 405-115.000.
Hardin, James R., to UOP Inc. Well screen assembly with longitudinally ported connector sub. 4,510,996, Cl. 166-227.000.
Hardt, Peter: *See—*
Lehky, Pavel; and Hardt, Peter, 4,511,734, Cl. 562-524.000.
Hare, Charles E. Body and frame straightening system. 4,510,790, Cl. 72-457.000.
Harlan, Wayne E.; and Marsh, James C., Jr., to RCA Corporation. Television receiver with manual and selectively disabled automatic picture control. 4,511,921, Cl. 358-161.000.
Harlos, Hartmut: *See—*
Matthies, Karl H.; and Harlos, Hartmut, 4,511,853, Cl. 330-259.000.
Harris Corporation: *See—*
DiStefano, Ralph D.; and Moldovan, Nicholas, 4,511,438, Cl. 204-4.000.
Motiwala, M. Arif; and Sutherland, Jack L., 4,511,862, Cl. 332-16.00R.
Pan, Jing-Jong, 4,511,813, Cl. 307-501.000.
Harris, Leonard C.: *See—*
Harris, Nancy T.; and Harris, Leonard C., 4,511,163, Cl. 285-177.000.
Harris, Nancy T.; and Harris, Leonard C., to Mead Johnson & Company. Adaptable tip tubing connector. 4,511,163, Cl. 285-177.000.
Hart-Carter Company: *See—*
Jones, Dennis J.; and Kunz, Gary L., 4,511,466, Cl. 209-395.000.
Hart, Richard A.: *See—*
Chenausky, Peter P.; and Hart, Richard A., 4,512,021, Cl. 372-20.000.
Hart, William; and McKittrick, Michael T., Jr., to Mattel, Inc. Winding and launching device for toy vehicles. 4,511,342, Cl. 446-429.000.
Hartwig, Carl S. M., to Institut Cerac S.A. Method of driving the impeller of a liquid pump by means of a brushless a.c. motor; and a liquid pump for carrying out the method. 4,511,312, Cl. 417-45.000.
Hasenack, Hendrikus J. A., to Shell Oil Company. Burner and process for the partial combustion of solid fuel. 4,510,874, Cl. 110-347.000.
Hashimoto, Minoru: *See—*
Hideyama, Shozo; Ishizawa, Akio; Kumagai, Katuya; and Hashimoto, Minoru, 4,511,617, Cl. 428-412.000.
Hatchett, Michael R.: *See—*
Farran, John; Hatchett, Michael R.; and Heath, John S., 4,510,841, Cl. 83-176.000.
Hattori, Katsuhide: *See—*
Kakino, Shigeru; Hattori, Katsuhide; Fukatsu, Yoshiaki; Moriyama, Hideo; and Sakakibara, Hidekazu, 4,511,412, Cl. 149-109.600.
Matsui, Fumio; Aono, Shin; Sakai, Hiroshi; Hattori, Katsuhide; and Kakino, Shigeru, 4,511,414, Cl. 149-109.600.
Hattori, Yoshinori: *See—*
Miura, Kazunori; Hattori, Yoshinori; and Matsuo, Yasushi, 4,511,402, Cl. 75-233.000.
Hatz, Ernst; and Absenger, Erich, to Motorenfabrik Hatz GmbH & Co. KG. Mechanism for actuating the valve rockers of an internal combustion engine. 4,510,897, Cl. 123-90.480.
Hauni-Werke Korber & Co. KG: *See—*
Greve, Heinz; and Wahle, Gunter, 4,510,885, Cl. 118-674.000.
Hauptmann, Edward G., to Wescam Services Inc. Apparatus for treating flue gas and methanol containing effluents. 4,511,379, Cl. 55-238.000.
Haver & Becker: *See—*
Muller, Mathias, 4,510,736, Cl. 53-567.000.
Hawkins, Ronald G.: *See—*
LaBarge, Robert L.; Horansky, Frank J.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,510,857, Cl. 100-53.000.
LaBarge, Robert L.; Pohlenz, Elmer E.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Scherf, Thomas W., 4,510,860, Cl. 100-49.000.
Hayashi, Chihiro; and Nakasuji, Kazuyuki, to Sumitomo Metal Industries, Ltd. Method of manufacturing hollow rods. 4,510,787, Cl. 72-368.000.
Hayashi, Hideki; Ito, Yukio; Akiike, Yukio; and Kinoshita, Shigeo, to Clarion Co., Ltd. Tape end detecting device in a tape player. 4,511,103, Cl. 242-186.000.
Hayashi, Mitsuyoshi: *See—*
Kudo, Shiro; and Hayashi, Mitsuyoshi, 4,511,588, Cl. 426-302.000.
Hayashida, Kenji, to Hosiden Electronics Co., Ltd. Rotary switch. 4,511,770, Cl. 200-6.00B.
Haynes, Charles W., to Joy Manufacturing Company. Slip mechanism. 4,511,168, Cl. 294-102.200.
Hazebrook, Daniel W.; Gehrke, Glenn F.; and Schmidt, Michael J., to GKN Automotive Components, Inc. Constant velocity universal joint. 4,511,346, Cl. 464-146.000.
Hazeltine Corporation: *See—*
Henrich, Kenneth J.; and Hana, Thomas C., 4,511,852, Cl. 330-252.000.
Heald, Anthony F.: *See—*
Bare, Thomas M.; and Heald, Anthony F., 4,511,568, Cl. 514-293.000.
Heath, John S.: *See—*
Farran, John; Hatchett, Michael R.; and Heath, John S., 4,510,841, Cl. 83-176.000.
Heath, Rodney T. Gas temperature control system for natural gas separator. 4,511,374, Cl. 55-20.000.
Hechenbleikner, Ingenuin; and Enlow, William P., to Borg-Warner Chemicals, Inc. Preparation of N-acyl-2,5-dimethylpyrroles from amides and acetonylacetone. 4,511,725, Cl. 548-530.000.
Heck, Gunter; Lienerth, Aladar; Malow, Egon; Schwarz, Karl-Heinz; and Faust, Uwe, to Hoechst Aktiengesellschaft. Process for the continuous rectification of alcoholic fermates. 4,511,437, Cl. 203-19.000.
Heckler & Koch GmbH: *See—*
Fritz, Raimund; and Zeyher, Fritz, 4,510,844, Cl. 89-135.000.
Heft, Eldon B.; Huseby, Irvin C.; and Szymaszek, Jan W., to General Electric Company. Molding composition for arc circuit breakers. 4,511,773, Cl. 200-144.00C.
Heidemann, Gerhard: *See—*
Jung, Thomas; and Heidemann, Gerhard, 4,511,007, Cl. 175-297.000.
Heilmann, Edmund: *See—*
Kintzel, Gerhard; and Heilmann, Edmund, 4,510,829, Cl. 82-36.00R.
Heine, Hans G.: *See—*
Hochstrasser, Otto; Heine, Hans G.; and Buechi, Heinz, 4,511,125, Cl. 266-135.000.
Heinerman, Jacobus J. L., to Shell Oil Company. Process for the hydroisomerization of paraffins. 4,511,752, Cl. 585-739.000.
Helena Laboratories Corporation: *See—*
Guadagno, Philip A.; and Sanford, James R. M., 4,511,533, Cl. 422-61.000.
Hempel, David A.: *See—*
Bierman, Laurence W.; Polinsky, Samuel M.; Hempel, David A.; and Humberger, Roger B., 4,511,541, Cl. 423-100.000.
Henderson, Deborah; and Street, Norman, to W. L. Gore & Associates, Inc. Barrier for use during cardiopulmonary resuscitation. 4,510,931, Cl. 128-202.280.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Pruhs, Horst; and Altenschopfer, Theodor, 4,511,487, Cl. 252-99.000.
Henrich, Kenneth J.; and Hana, Thomas C., to Hazeltine Corporation. Differential amplifier having balanced output. 4,511,852, Cl. 330-252.000.
Herbage, Daniel: *See—*
Play, Dominique; Bonneau, Marc; Merieux, Charles; Herbage, Daniel; and Comte, Philippe, 4,511,653, Cl. 435-69.000.
Hereit, Frantisek; and Mutl, Silvestr, to Hydroprojekt. Apparatus for the simultaneous formation and separation of a liquid suspension. 4,511,467, Cl. 210-173.000.
Herlein, Dick: *See—*
Nagy, Alex; and Herlein, Dick, 4,511,846, Cl. 328-164.000.
Herman, Alexander: *See—*
Frankel, Robert S.; and Herman, Alexander, 4,512,025, Cl. 375-36.000.
Hermanson, Terry, to Mr. Christmas Incorporated. Foldable umbrella. 4,510,955, Cl. 135-25.00R.
Herron, Lorne R., to Atlas Copco Aktiebolag. Method of rock bolting and rock bolt. 4,511,289, Cl. 405-259.000.

Herzog, Siegfried: *See*—
Klein, Wilhelm; Koske, Jorg; Herzog, Siegfried; Jordan, Hans-Peter; Bauer, Wilhelm; Bausch, Max; and Grabner, Christian, 4,511,214, Cl. 350-632.000.
Hesse, Theodor; and Barkmeyer, Hans, to Engelbrecht & Lemmerbrock GmbH & Co. Pneumatic suction devices for discharging granulates. 4,511,292, Cl. 406-152.000.
Hewlett-Packard Company: *See*—
Georg, Dennis D.; and Osecky, Benjamin D., 4,511,964, Cl. 364-200.000.
Hiatt, Norman A.: *See*—
Boyd, Mary G.; Smith, Donald R.; Imondi, Peter F.; Hiatt, Norman A.; Bauer, Fritz E.; Anemaet, John M.; and MacKenzie, Alfred K., 4,511,425, Cl. 156-493.000.
Margerum, Edward S.; and Hiatt, Norman A., 4,511,602, Cl. 427-148.000.
Hicks, Darrell D., to Celanese Corporation. Low viscosity UV curable polyacrylates. 4,511,732, Cl. 560-221.000.
Hidaka, Tsuneo; Inoue, Masahide; and Ogiso, Makoto, to Asahi Kogaku Kogyo Kabushiki Kaisha. Artificial apatite dental root. 4,511,336, Cl. 433-173.000.
Hideyama, Shozo; Ishizawa, Akio; Kumagai, Katuya; and Hashimoto, Minoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic recording medium. 4,511,617, Cl. 428-412.000.
Hieber, Konrad: *See*—
Schwabe, Ulrich; Neppl, Franz; and Hieber, Konrad, 4,510,670, Cl. 29-571.000.
Higashi, Kensaku; Yano, Haruhiko; Sato, Hirotsugu; Sukegawa, Ken; and Ooba, Yuji, to Nippon Telegraph and Telephone Public Corp.; and Tomoegawa Paper Manufacturing Co., Ltd. Photo-fixing heat-sensitive recording media with photosensitive diazonium salt, coupler, and organic boron salt. 4,511,642, Cl. 430-161.000.
Hightower, Floyd. Adjustable sling for rifles, shotguns or the like. 4,511,070, Cl. 224-150.000.
Higuchi, Fumio: *See*—
Ida, Jinsei; Fujita, Tsutomu; Yamada, Ichiho; Higuchi, Fumio; and Matsuo, Kenzaburo, 4,510,669, Cl. 29-568.000.
Hikin, Boris L.: *See*—
Prussin, Simon A.; and Hikin, Boris L., 4,510,798, Cl. 73-150.00R.
Hine, Jean Patrick: *See*—
Flot, Regis; and Hine, Jean Patrick, 4,510,827, Cl. 81-9.400.
Hirai, Hiroyuki; and Kawata, Ken, to Fuji Photo Film Co., Ltd. Heat developable color light-sensitive materials with base releasors. 4,511,650, Cl. 430-559.000.
Hirai, Koichi: *See*—
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,511,744, Cl. 568-864.000.
Hirai, Masaru: *See*—
Hisamoto, Iwao; Maeda, Chiaki; and Hirai, Masaru, 4,511,733, Cl. 560-253.000.
Hiraiwa, Kazuyoshi: *See*—
Kawamoto, Tamio; and Hiraiwa, Kazuyoshi, 4,510,817, Cl. 74-477.000.
Hirakawa, Manabu: *See*—
Shimomura, Takatoshi; Fujita, Fumio; and Hirakawa, Manabu, 4,511,711, Cl. 528-489.000.
Hirano, Hiroyuki: *See*—
Yamamuro, Sigeaki; Hirano, Hiroyuki; Morimoto, Yoshiro; and Tanaka, Yoshikazu, 4,510,822, Cl. 74-733.000.
Hirano, Tsumoru; Yagihara, Morio; and Umemoto, Makoto, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,511,647, Cl. 430-381.000.
Hirata, Masanobu: *See*—
Nishikawa, Hisashi; Suzuki, Satoshi; Hirata, Masanobu; Sakamoto, Koichiro; Fujisawa, Ikuo; and Takeno, Shozo, 4,511,877, Cl. 338-2.000.
Hirose, Hideo, to Nippon Kogaku K.K. Telecentric variable power illumination system. 4,511,223, Cl. 350-523.000.
Hisamoto, Iwao; Maeda, Chiaki; and Hirai, Masaru, to Daikin Kogyo Co., Ltd. Fluorine-containing aminocarboxylic acid compounds. 4,511,733, Cl. 560-253.000.
Hise, Ralph E.; and Swenson, Paul F., to Consolidated Natural Gas Service Company, Inc. Cogeneration. 4,510,756, Cl. 60-659.000.
Hitachi Cable Ltd.: *See*—
Natori, Takeshi; Kobayashi, Yoji; Watanabe, Shigetaka; Shimizu, Katsumi; Matsumura, Ikuei; Namekawa, Yoshihiro; and Miyanaga, Satoshi, 4,510,974, Cl. 138-137.000.
Hitachi Chemical Company: *See*—
Yoshida, Masatoshi; and Miyadera, Yasuo, 4,511,681, Cl. 523-310.000.
Hitachi Chemical Company, Ltd.: *See*—
Makino, Daisuke; Sato, Hidetaka; Suzuki, Hiroshi; Uchimura, Shun-ichiro; and Suzuki, Hiroshi, 4,511,705, Cl. 528-26.000.
Hitachi Const. Mach. Company: *See*—
Shimada, Satoshi; Murayama, Ken; Kobori, Shigeyuki; and Kawakami, Kanji, 4,511,878, Cl. 338-4.000.
Hitachi Construction Machinery Co., Ltd.: *See*—
Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,510,750, Cl. 60-443.000.
Hitachi Denshi Kabushiki Kaisha: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,511,990, Cl. 364-748.000.
Hitachi Engineering Kabushiki Kaisha: *See*—
Kawano, Hikaru; Sato, Koji; and Nogi, Hiroyoshi, 4,511,301, Cl. 414-43.000.
Hitachi, Ltd.: *See*—
Atago, Takeshi; and Manaka, Toshio, 4,510,907, Cl. 123-435.000.
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,511,990, Cl. 364-748.000.
Kanda, Hiroshi; and Ishikawa, Isao, 4,510,810, Cl. 73-606.000.
Kanda, Hiroshi; Ishikawa, Isao; and Kondo, Toshio, 4,511,998, Cl. 367-11.000.
Machida, Tetsuo; Tsuhara, Susumu; Tabata, Kuniaki; and Okada, Yasuyuki, 4,511,962, Cl. 364-200.000.
Makino, Daisuke; Sato, Hidetaka; Suzuki, Hiroshi; Uchimura, Shun-ichiro; and Suzuki, Hiroshi, 4,511,705, Cl. 528-26.000.
Matsuda, Toshiharu; Imamura, Minoru; and Saho, Norihide, 4,510,771, Cl. 62-514.00R.
Mizutani, Tatsumi; Ohgata, Toshihide; and Komatsu, Hideo, 4,511,429, Cl. 156-643.000.
Morinaga, Shigeki; Miyashita, Kunio; and Sugiura, Yasuyuki, 4,511,827, Cl. 318-254.000.
Nagano, Takahiro, 4,511,913, Cl. 357-38.000.
Nakamura, Yoichi; Yamamoto, Akio; Nogita, Shunsuke; Kuge, Toshio; and Muroi, Katsumi, 4,511,363, Cl. 44-1.00G.
Okano, Yoshio; and Okuma, Yasuo, 4,511,970, Cl. 364-401.000.
Satake, Shozo, 4,511,812, Cl. 307-465.000.
Shimada, Satoshi; Murayama, Ken; Kobori, Shigeyuki; and Kawakami, Kanji, 4,511,878, Cl. 338-4.000.
Takahashi, Kazue; Okuna, Kenzi; Nakajima, Isao; Harada, Mineo; and Kako, Yutaka, 4,511,269, Cl. 400-124.000.
Hjorth-Hansen, Arne. Apparatus for controlling the inflation of tires. 4,510,979, Cl. 141-95.000.
Hlusko, Edward G. Manually operable resizing cartridge press and method for operating same. 4,510,842, Cl. 86-25.000.
Hobart Corporation: *See*—
Mathieu, Raymond J., 4,510,731, Cl. 53-66.000.
Hobbs, Charles F., to Monsanto Company. Catalyst and reverse disproportionation process. 4,511,672, Cl. 502-243.000.
Hochstrasser, Otto; Heine, Hans G.; and Buechi, Heinz, to BBC Brown Boveri, Inc. Ladle scraper mechanism. 4,511,125, Cl. 266-135.000.
Hoddie Corporation, Inc., The: *See*—
Krause, Glenn C.; and Blounts, Joseph, 4,511,063, Cl. 222-75.000.
Hodge, David H.: *See*—
Mitchell, Terry L.; and Hodge, David H., 4,511,198, Cl. 339-34.000.
Hoechst Aktiengesellschaft: *See*—
Heck, Gunter; Lienerth, Aladar; Malow, Egon; Schwarz, Karl-Heinz; and Faust, Uwe, 4,511,437, Cl. 203-19.000.
Schrodter, Klaus; and Maurer, Alexander, 4,511,546, Cl. 423-305.000.
Hoeffken, Russell W., to Snyder General Corporation. Method of manufacturing a two-plate heat exchanger. 4,510,660, Cl. 29-157.30D.
Hofelt, Martijn H. H.; de Niet, Edmond; and Rijckaert, Albert M. A., to U.S. Philips Corporation. Method and apparatus for recording a digital information signal. 4,511,933, Cl. 360-47.000.
Hofer, Beat: *See*—
Brunner, Paul; and Hofer, Beat, 4,511,411, Cl. 148-20.300.
Hoffman, Allan S.: *See*—
Nowinski, Robert C.; and Hoffman, Allan S., 4,511,478, Cl. 210-691.000.
Hoffman, Carvel D.: *See*—
Tatham, Edward J.; Kravits, Richard; Clymer, John C.; and Hoffman, Carvel D., 4,511,801, Cl. 250-394.000.
Hoffmann-La Roche Inc.: *See*—
Ramuz, Henri, 4,511,720, Cl. 546-273.000.
Hoffmann, Wolfgang: *See*—
Sauer, Wolfgang; and Hoffmann, Wolfgang, 4,511,739, Cl. 568-473.000.
Hofmann, Lee G.; and Dittmar, Charles J., Jr., to General Electric Company. Large angle, gravity compensated, bank-to-turn pursuit controller. 4,511,972, Cl. 364-434.000.
Hohne, Gerd: *See*—
Bodig, Bernd; Hohne, Gerd; and Schmied, Helmut, 4,512,019, Cl. 371-12.000.
Holland, Gerald F., to Pfizer Inc. Antidiabetic pyrrolecarboxylic acids. 4,511,575, Cl. 514-423.000.
Holland, Gerald F., to Pfizer Inc. Antidiabetic pyrrolecarboxylic acids. 4,511,576, Cl. 514-423.000.
Hollingsead International, Inc.: *See*—
Espinoza, Cesar, 4,510,650, Cl. 24-16.0PB.
Holonyak, Nick, Jr., to University of Illinois, The Board of Trustees of The. Semiconductor device fabrication with disordering elements introduced into active region. 4,511,408, Cl. 148-1.500.
Holstedt, Richard A.; Baron, Kenneth; and Jessup, Peter, to Union Oil Company of California. Boron containing heterocyclic compounds. 4,511,516, Cl. 260-462.00R.
Holt, Peter J., to Formflo Limited. Ring rolling. 4,510,781, Cl. 72-105.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ida, Jinsei; Fujita, Tsutomu; Yamada, Ichiho; Higuchi, Fumio; and Matsuo, Kenzaburo, 4,510,669, Cl. 29-568.000.
Miyakoshi, Shinichi; and Tsunoda, Kazuhiko, 4,511,013, Cl. 180-227.000.
Otobe, Yutaka, 4,510,911, Cl. 123-493.000.
Tsuboi, Masaharu, 4,510,820, Cl. 74-474.000.
Yatabe, Fumio; and Ozaki, Syunzaburo, 4,510,901, Cl. 123-325.000.

Honda, Naojiro: *See—*
Sakai, Takashi; Honda, Naojiro; and Yonezu, Ikuo, 4,510,759, Cl. 62-48.000.
Honeywell GmbH: *See—*
Multrus, Vladimir, 4,510,961, Cl. 137-86.000.
Honeywell Inc.: *See—*
Arcara, Samuel A., 4,511,262, Cl. 374-37.000.
Honeywell Information Systems Inc.: *See—*
Boudreau, Daniel A., 4,511,960, Cl. 364-200.000.
Honma, Kazuo: *See—*
Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,510,750, Cl. 60-443.000.
Hoogovens Groep B.V.: *See—*
Ploegaert, Hendrikus T.; Molenaar, Ronald N.; and Butter, Johannes A. M., 4,510,793, Cl. 73-86.000.
Hopkins, Bob C.: *See—*
Jennings, Charles E.; Barrington, Claud C.; Chen, Lien-Yan; Hopkins, Bob C.; McIntyre, John N.; and Regitz, Alfred P., 4,510,960, Cl. 137-75.000.
Hopmann, Mark E.: *See—*
Krause, William F., Jr.; and Hopmann, Mark E., 4,510,995, Cl. 166-217.000.
Hoppe, Manfred: *See—*
Schmid, Eduard; and Hoppe, Manfred, 4,511,684, Cl. 524-101.000.
Horansky, Frank J.: *See—*
LaBarge, Robert L.; Horansky, Frank J.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,510,857, Cl. 100-53.000.
LaBarge, Robert L.; Pohlenz, Elmer E.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Scherf, Thomas W., 4,510,860, Cl. 100-49.000.
Hori, Tatsu, to Savin Corporation. Traversing, intermittently contacting sheet pickoff for electrophotographic copier. 4,511,238, Cl. 355-3.0SH.
Horikoshi, Toshio: *See—*
Watanabe, Katsuhiro; Minei, Masayuki; and Horikoshi, Toshio, 4,510,951, Cl. 132-7.000.
Horiuchi, Teruo, to Kabushiki Kaisha Daini Seikosha. Bar code input electronic timepiece. 4,511,259, Cl. 368-10.000.
Horiya, Keiichi: *See—*
Miyazaki, Naoki; Horiya, Keiichi; Shiozaki, Tsugio; and Takahama, Kazuhide, 4,511,903, Cl. 346-76.0PH.
Horn, Dieter: *See—*
Nissen, Axel; Horner, Michael; Horn, Dieter; Lueddecke, Erik; and Teege, Gernot, 4,511,685, Cl. 524-110.000.
Hornak, Leonard P.: *See—*
Swidwa, Kenneth J.; Hornak, Leonard P.; and Kowalski, Edward F., 4,511,531, Cl. 376-262.000.
Horner, Jerome T.: *See—*
Craver, Joseph N.; and Horner, Jerome T., 4,511,609, Cl. 428-35.000.
Horner, Michael: *See—*
Nissen, Axel; Horner, Michael; Horn, Dieter; Lueddecke, Erik; and Teege, Gernot, 4,511,685, Cl. 524-110.000.
Hornung, Rainer: *See—*
Ehrlich, Willibald; Jocss, Hans; and Hornung, Rainer, 4,511,606, Cl. 427-386.000.
Horodysky, Andrew G., to Mobil Oil Corporation. N-hydrocarbylhydrocarbylenediamine carboxylate and lubricants containing same. 4,511,482, Cl. 252-34.000.
Horton, Edward E., to Global Marine, Inc. Submerged buoyant offshore drilling and production tower. 4,511,287, Cl. 405-204.000.
Horton, Robert L.; and Stahl, G. Allan, to Phillips Petroleum Company. Ion exchange-active compositions consisting of water-soluble polyelectrolyte upon ion exchange functional substrate. 4,511,677, Cl. 521-28.000.
Hoshino, Isao: *See—*
Murakami, Teruo; and Hoshino, Isao, 4,512,006, Cl. 369-50.000.
Hosiden Electronics Co., Ltd.: *See—*
Hayashida, Kenji, 4,511,770, Cl. 200-6.00B.
Hosono, Nagao: *See—*
Kanbe, Junichiro; and Hosono, Nagao, 4,511,239, Cl. 355-3.0DD.
Hosotani, Takeo: *See—*
Yokoyama, Akira; Arano, Yasushi; and Hosotani, Takeo, 4,511,550, Cl. 424-1.100.
Hou, Kenneth C., to AMF Incorporated. Fibrous media containing millimicron-sized particulates. 4,511,473, Cl. 210-348.000.
Houdaille Industries, Inc.: *See—*
Crowley, John E., 4,510,977, Cl. 140-123.000.
House, David W.: *See—*
Swedo, Raymond J.; and House, David W., 4,511,492, Cl. 252-500.000.
Howard, David M.: *See—*
Fourcin, Adrian J.; Howard, David M.; and Walliker, John R., 4,510,936, Cl. 128-419.00R.
Howard, Glenn. Densification - pelletizing of organic materials. 4,511,321, Cl. 425-331.000.
Howie, Robert K., Jr., to Grigoleit Company, The. Knob with decorative end cap and method of manufacturing it. 4,510,666, Cl. 29-511.000.
Hsia, Chung H.: *See—*
Wright, Bernard S.; Hsia, Chung H.; and Owen, Hartley, 4,511,747, Cl. 585-415.000.
Hsia, Min A., to Norton Company. Tower packing elements. 4,511,519, Cl. 261-94.000.
Hsu, James P.: *See—*
Hsu, Michael S.; and Hsu, James P., 4,511,216, Cl. 350-311.000.
Hsu, Joseph. Fabrication of a composite material racket frame. 4,511,523, Cl. 264-46.600.
Hsu, Michael S.; and Hsu, James P., to United States of America, Air Force. High power laser dump. 4,511,216, Cl. 350-311.000.
Hsu, Yu-Wen, to Kaiser Aluminum & Chemical Corporation. Rolling mill spray bar. 4,510,784, Cl. 72-201.000.
Huang, Yi-Shiou: *See—*
Anantha, Narasipur G.; Gaur, Santosh P.; Huang, Yi-Shiou; and Tsang, Paul J., 4,510,676, Cl. 29-577.00C.
Hudson, William S.: *See—*
Neron, Joseph; Hudson, William S.; and Miller, Ronald L., 4,510,825, Cl. 81-57.290.
Huerta, Jose L.; Rachui, Roy A.; Roberts, James E.; and Simpson, Grainger L., Jr., to International Business Machines Corporation. Enhanced envelope feeding. 4,511,135, Cl. 271-126.000.
Hughes, Charles C., to R. A. Jones & Co. Inc. Lockout for a rotary feeder. 4,511,134, Cl. 271-113.000.
Hulbritt Developments Limited: *See—*
Edmondson, Alan S., 4,510,730, Cl. 53-53.000.
Hultgren, Kent G., to Westinghouse Electric Corp. Combustion turbine single airfoil stator vane structure. 4,511,306, Cl. 415-136.000.
Humberger, Roger B.: *See—*
Bierman, Laurence W.; Polinsky, Samuel M.; Hempel, David A.; and Humberger, Roger B., 4,511,541, Cl. 423-100.000.
Hunt Manufacturing Co.: *See—*
Godfrey, Steven W.; Stern, Allen M.; and MacGregor, Fran W., 4,511,111, Cl. 248-459.000.
Hunziker, Martin; and Schildknecht, Albert. Process for the utilization of household rubbish or garbage and other organic waste products for the production of methane gas. 4,511,370, Cl. 48-197.00A.
Huseby, Irvin C.: *See—*
Heft, Eldon B.; Huseby, Irvin C.; and Szymaszek, Jan W., 4,511,773, Cl. 200-144.00C.
Hustler Conveyor Company: *See—*
Moore, Joseph, 4,511,302, Cl. 414-327.000.
Hutchins, Burleigh M.; and Abrahams, Louis, to Zymark Corporation. Robot tool system. 4,510,684, Cl. 29-703.000.
Hutchinson: *See—*
Bernuchon, Marc; Pompei, Michel; and Gregoire, Daniel, 4,511,126, Cl. 267-140.100.
Huth, Joseph F., III: *See—*
Olmsted, Robert W.; and Huth, Joseph F., III, 4,511,872, Cl. 336-83.000.
Huther, Werner; and Rossmann, Axel, to Motoren-und Turbinen-Union Munchen GmbH. Multiple-layer wall for a hollow body and method for manufacturing same. 4,511,612, Cl. 428-36.000.
Hutten, Heinrich: *See—*
Ballik, Rainer; and Hutten, Heinrich, 4,511,082, Cl. 239-8.000.
Hwang, Edward F.: *See—*
Okamoto, Yoshiyuki; and Hwang, Edward F., 4,511,702, Cl. 526-90.000.
Hydroprojekt: *See—*
Hereit, Frantisek; and Mutl, Silvestr, 4,511,467, Cl. 210-173.000.
Ianni, John P., Jr.: *See—*
Shils, Alan J.; and Ianni, John P., Jr., 4,510,673, Cl. 29-574.000.
ICI Americas Inc.: *See—*
Bare, Thomas M.; and Heald, Anthony F., 4,511,568, Cl. 514-293.000.
ICI Australia Limited: *See—*
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; and Farquharson, Graeme J., 4,511,391, Cl. 71-88.000.
Ida, Jinsei; Fujita, Tsutomu; Yamada, Ichiho; Higuchi, Fumio; and Matsuo, Kenzaburo, to Honda Giken Kogyo Kabushiki Kaisha. Replaceable gang head machine tool. 4,510,669, Cl. 29-568.000.
Ida, Mitsuru, to Sony Corporation. Cassette tape apparatus with adjustable head positioning characteristics. 4,511,941, Cl. 360-105.000.
Ideno, Eizo; Fukushi, Shinichi; Tai, Masahiko; Nakazawa, Koji; and Fujita, Toshihito, to Shimadzu Corporation; and Nitto Boseki Co., Ltd. Method and apparatus for winding glass fibers. 4,511,095, Cl. 242-18.00G.
Iida, Masanao: *See—*
Toma, Ken; Iida, Masanao; and Takeuchi, Yo, 4,511,632, Cl. 428-654.000.
Iida, Takao: *See—*
Tomita, Fusao; Tamaoki, Tatsuya; Shirahata, Kunikatsu; Iida, Takao; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,511,560, Cl. 514-27.000.
Iijima, Toshifumi: *See—*
Yamashita, Kiyoshi; and Iijima, Toshifumi, 4,511,648, Cl. 430-503.000.
Iijima, Yukihiko; and Kobayashi, Sadame, to Nippon Electric Co., Ltd. Television signal amplitude detection circuit. 4,511,920, Cl. 358-139.000.
Iiyama, Kiyotaka: *See—*
Taniguchi, Keishi; and Iiyama, Kiyotaka, 4,511,910, Cl. 346-216.000.
Ikeda, Hiroaki: *See—*
Maeda, Masatoshi; Katsurai, Junji; and Ikeda, Hiroaki, 4,511,929, Cl. 358-296.000.
Ikezawa, Harumi: *See—*
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,511,744, Cl. 568-864.000.

Imai, Hirosuke: *See*—
Kudoh, Michio; Matsuno, Mitsuo; and Imai, Hirosuke, 4,511,748, Cl. 585-467.000.

Imai, Iwao: *See*—
Ishikawa, Yasuki; Endo, Hiroshi; Sone, Masazumi; and Imai, Iwao, 4,510,915, Cl. 123-620.000.

Imai, Shigeru: *See*—
Matsumoto, Masao; and Imai, Shigeru, 4,510,662, Cl. 29-408.000.

Imai, Yougo; and Takenaga, Hideo, to Olympus Optical Company Limited. Tape recorder. 4,511,935, Cl. 360-66.000.

Imamichi, Tutomu, to Omron Tateisi Electronics Co. System for performing transactions. 4,511,794, Cl. 235-379.000.

Imamura, Minoru: *See*—
Matsuda, Toshiharu; Imamura, Minoru; and Saho, Norihide, 4,510,771, Cl. 62-514.00R.

Imataki, Mitsumasa: *See*—
Matsumura, Susumu; and Imataki, Mitsumasa, 4,511,957, Cl. 363-54.000.

Imondi, Peter F.: *See*—
Boyd, Mary G.; Smith, Donald R.; Imondi, Peter F.; Hiatt, Norman A.; Bauer, Fritz E.; Anemaet, John M.; and MacKenzie, Alfred K., 4,511,425, Cl. 156-493.000.

Imperial Clevite Inc.: *See*—
Snyder, Daniel S.; and Benincasa, Timothy C., 4,511,869, Cl. 334-20.000.

Inaba, Hajimu; and Sakakibara, Shinsuke, to Fanuc Ltd. Robot control system. 4,511,985, Cl. 364-513.000.

Inaba, Yutaka, to Tokyo Medical and Dental University. Support device for medical instruments. 4,510,926, Cl. 128-20.000.

Inami, Mamoru; Tanaka, Yoshiaki; and Otsuki, Zenju, to Victor Company of Japan, Limited. Musical note display device. 4,510,840, Cl. 84-477.00R.

Incerti Baldi, Andrea: *See*—
Ruscitti, Tomaso; Albini, Giovanni; Torretta, Roberto; and Incerti Baldi, Andrea, 4,511,064, Cl. 222-153.000.

Industrial Woodworking Machine Co. Inc.: *See*—
Cromeens, Jeff Y., 4,510,835, Cl. 83-471.200.

Ingermann, Donald E.; Smith, Ronald L.; Knoll, Jimmie L.; Caffrey, Stephen F.; Barsi, Endre; and Dechant, Joseph C., to Century International Corp. Combination bowling lane stripper and duster. 4,510,642, Cl. 15-231.000.

Inoue, Akitoshi: *See*—
Tanaka, Seiitch; and Inoue, Akitoshi, 4,511,448, Cl. 204-198.000.

Inoue, Hiroshi: *See*—
Tsuge, Akihiko; Komatsu, Michiyasu; Inoue, Hiroshi; and Komeya, Katsutoshi, 4,511,525, Cl. 264-65.000.

Inoue, Hitoshi, to Mazda Motor Corporation. Vehicle rear wheel suspension. 4,511,160, Cl. 280-701.000.

Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,511,595, Cl. 427-43.100.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Laser-activated chemical-depositing method and apparatus. 4,511,595, Cl. 427-43.100.

Inoue, Masahide: *See*—
Hidaka, Tsuneo; Inoue, Masahide; and Ogiso, Makoto, 4,511,336, Cl. 433-173.000.

Inoue, Satoru: *See*—
Ohsumi, Tadashi; Inoue, Satoru; and Maeda, Kiyoto, 4,511,581, Cl. 514-617.000.

Inoue, Takehisa: *See*—
Iwayama, Kazuyoshi; Kamano, Takao; Tada, Kuniyuki; and Inoue, Takehisa, 4,511,547, Cl. 423-329.000.

Inoue, Tetsuzo: *See*—
Kawabata, Susumu; Inoue, Tetsuzo; Miyamoto, Noriaki; Shibuya, Masanobu; and Kaneko, Masashi, 4,510,745, Cl. 57-415.000.

Institut Cerac S.A.: *See*—
Hartwig, Carl S. M., 4,511,312, Cl. 417-45.000.

Institut Francais du Petrole: *See*—
Billon, Alain; Jacquin, Yves; Peries, Jean-Pierre; and Toulhoat, Herve , 4,511,458, Cl. 208-59.000.
Denis, Jacques; Sillion, Bernard; Damin, Bernard; and Leger, Robert, 4,511,369, Cl. 44-62.000.
Seite, Claude; Commereuc, Dominique; and Chauvin, Yves, 4,511,743, Cl. 568-814.000.

Institutet for Optisk Forskning: *See*—
Thylen, Lars; Stensland, Leif; and Arvidsson, Gunnar, 4,511,206, Cl. 350-96.110.

Instrumentarium Oy: *See*—
Rantala, Borje, 4,511,847, Cl. 328-167.000.

International Business Machines: *See*—
Bellar, Robert J.; Golden, William G.; Saperstein, David D.; and Vats, Ashok, 4,511,986, Cl. 364-576.000.
Betts, Alan J., 4,511,938, Cl. 360-77.000.

International Business Machines Corporation: *See*—
Alt, Richard C.; and Pinter, Joseph, 4,510,862, Cl. 101-93.140.
Anantha, Narasipur G.; Gaur, Santosh P.; Huang, Yi-Shiou; and Tsang, Paul J., 4,510,676, Cl. 29-577.00C.
Ashbee, William H.; Janssen, Donovan M.; Martin, Ronald J.; and Seaward, William S., 4,511,242, Cl. 355-14.00C.
Chen, Lee; and Mathad, Gangadhara S., 4,511,430, Cl. 156-643.000.
Chu, Richard, 4,510,685, Cl. 29-837.000.
Farran, John; Hatchett, Michael R.; and Heath, John S., 4,510,841, Cl. 83-176.000.
Garwin, Richard L.; and Levine, James L., 4,511,760, Cl. 178-18.000.
Ghosh, Hitendra; Murgai, Ashok; and Westdorp, Wolfgang A., 4,511,428, Cl. 156-601.000.
Huerta, Jose L.; Rachui, Roy A.; Roberts, James E.; and Simpson, Grainger I., Jr., 4,511,135, Cl. 271-126.000.
Kantner, Robert F., 4,511,963, Cl. 364-200.000.
Kenney, Donald M., 4,511,911, Cl. 357-23.600.
Shils, Alan J.; and Ianni, John P., Jr., 4,510,673, Cl. 29-574.000.

International Coal Refining Company: *See*—
Baumert, Kenneth L.; Sagues, Alberto A.; and Davis, Burtron H., 4,511,453, Cl. 208-8.0LE.
Baumert, Kenneth L.; Sagues, Alberto A.; and Davis, Burtron H., 4,511,460, Cl. 208-348.000.

International Medical Electronics, Ltd.: *See*—
Rogers, Noel A., 4,510,937, Cl. 128-422.000.

International Meehanite Metal Company Limited, The: *See*—
Mannion, Geoffrey; and Palmer, Patrick V., 4,511,401, Cl. 75-130.00R.

International Rectifier Corporation: *See*—
Wood, Peter N., 4,511,815, Cl. 307-584.000.

International Standard Electric Corporation: *See*—
Crossland, William A.; Ross, Peter W.; and Ayliffe, Peter J., 4,511,926, Cl. 358-236.000.
Kuehn, Volker; Rothfuss, Werner; and Widmaier, Richard, 4,511,421, Cl. 156-356.000.
Weiss, Eberhard, 4,511,340, Cl. 445-6.000.

Inui, Masaki, to Toyota Jidosha Kabushiki Kaisha. Device for preventing reverse gear buzzing in a manual transmission. 4,510,818, Cl. 74-477.000.

Inui, Masaki, to Toyota Jidosha Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Device for preventing reverse gear buzzing in a manual transmission. 4,510,819, Cl. 74-477.000.

Inui, Tsuneo: *See*—
Fujimoto, Terunori; Shimizu, Nobuyoshi; Shimizu, Mutsuhiro; Yanagihara, Kazunori; Miyachi, Akio; and Inui, Tsuneo, 4,511,631, Cl. 428-632.000.

Invacare Corporation: *See*—
Klimo, Robert G., 4,511,825, Cl. 318-67.000.

Invocas, Inc.: *See*—
Stol, Israel, 4,511,296, Cl. 411-20.000.

Iowa State University Research Foundation, Inc.: *See*—
Runyan, William S., 4,511,211, Cl. 350-117.000.

IPS Interproject Service AB: *See*—
Axelsson, Carl-Lennart, 4,511,372, Cl. 48-197.00R.

Ireland, Thomas R.: *See*—
Alley, Philip J.; and Ireland, Thomas R., 4,510,772, Cl. 63-12.000.

Irlande, Jean-Paul. Apparatus for controlling transfers of files between computers. 4,511,759, Cl. 178-2.00R.

Irvine, Robert L.: *See*—
Colaruotolo, Joseph F.; Irvine, Robert L.; Ketchum, Lloyd H., Jr.; and Ying, Wei-chi, 4,511,657, Cl. 435-253.000.

Ischen, Gunter: *See*—
Grunsky, Manfred; Sussmuth, Reiner; and Ischen, Gunter, 4,511,294, Cl. 408-232.000.

Iseki, Masahide: *See*—
Tsudaka, Hideaki; Washio, Takaji; Kozuka, Nobuhiko; Iseki, Masahide; Watanabe, Toshio; Kai, Masami; Yoshiyama, Toshio; and Sakata, Hiromi, 4,511,241, Cl. 355-14.0CU.

Ishida, Kenichi; and Takahashi, Tetsuro, to Tsugami Corporation. Machining center. 4,510,668, Cl. 29-561.000.

Ishida, Toshihiko: *See*—
Nunokawa, Eiichi; Ishida, Toshihiko; and Ohira, Yasuo, 4,511,099, Cl. 242-71.800.

Ishigaki Kiko Co., Ltd.: *See*—
Iwatani, Akitoshi, 4,511,469, Cl. 210-225.000.

Ishihama, Hiroshi: *See*—
Umezawa, Hamao; Oono, Masaji; Ishihama, Hiroshi; Kyotani, Yoshinori; and Takahashi, Yoshio, 4,511,509, Cl. 260-239.00A.

Ishii, Tamaki; Yachigo, Shinichi; and Takahashi, Yukoh, to Sumitomo Chemical Co., Ltd. Stabilizers for synthetic resins. 4,511,491, Cl. 252-404.000.

Ishikawa, Isao: *See*—
Kanda, Hiroshi; and Ishikawa, Isao, 4,510,810, Cl. 73-606.000.
Kanda, Hiroshi; Ishikawa, Isao; and Kondo, Toshio, 4,511,998, Cl. 367-11.000.

Ishikawa, Yasuki; Endo, Hiroshi; Sone, Masazumi; and Imai, Iwao, to Nissan Motor Company, Limited. Plasma ignition system for an internal combustion engine. 4,510,915, Cl. 123-620.000.

Ishimori, Isao: *See*—
Matoba, Yasuo; and Ishimori, Isao, 4,511,698, Cl. 525-187.000.

Ishino, Yoshitane; Naruse, Toshihisa; and Sawano, Toshiyuki, to Kabushiki Kaisha Komatsu Seisakusho. Water-bottom rubbles leveling apparatus. 4,510,705, Cl. 37-54.000.

Ishizawa, Akio: *See*—
Hideyama, Shozo; Ishizawa, Akio; Kumagai, Katuya; and Hashimoto, Minoru, 4,511,617, Cl. 428-412.000.

Ishizuka, Seiichi; and Kubo, Junji, to Teijin Limited. Methods of controlling the concentration of calcium in the serum of warm-blooded animals and pharmaceutical compositions to be used therefor. 4,511,564, Cl. 514-167.000.

Ishizuka, Yutaka; and Shibuya, Tsunenori, to Diesel Kiki Company, Ltd. Compression capacity control apparatus for swash plate compressor. 4,511,313, Cl. 417-270.000.

Isobe, Yukihiro: *See*—
Konno, Ryozo; Sugai, Makio; Kubota, Yuichi; Nishimatsu, Masaharu; Isobe, Yukihiro; Tanaka, Kazushi; and Shinoura, Osamu, 4,511,629, Cl. 428-522.000.

Isolite Babcock Refractories Co., Ltd.: *See*—
Yamamoto, Masafumi, 4,511,664, Cl. 501-35.000.

Isuzu Motors Limited: *See—*
Kawamura, Hideo, 4,511,792, Cl. 219-499.000.
Ito, Hajime: *See—*
Yano, Naomichi; Makido, Isao; and Ito, Hajime, 4,510,921, Cl. 126-429.000.
Ito, Yukio: *See—*
Hayashi, Hideki; Ito, Yukio; Akiike, Yukio; and Kinoshita, Shigeo, 4,511,103, Cl. 242-186.000.
ITT Corporation: *See—*
Rosebrooks, Nathan B., 4,510,884, Cl. 118-405.000.
ITT Industries, Inc.: *See—*
Adam, Fritz G., 4,511,881, Cl. 340-347.0DA.
Drake, Cyril F.; Jones, Ronald; Bateson, Paul F.; Grant, Ronald J.; and Burrage, Martin E., 4,511,404, Cl. 106-14.120.
Fritz, Bernd, 4,511,218, Cl. 350-356.000.
Marianu, Vlad, 4,511,019, Cl. 188-72.200.
Iwamoto, Akito: *See—*
Sekizawa, Hidekazu; Iwamoto, Akito; Togashi, Kousaku; and Fujie, Hideo, 4,510,866, Cl. 101-365.000.
Iwasaki, Masayuki: *See—*
Koike, Mitsuru; Kobayashi, Kesanao; Toyama, Tadao; Misu, Hiroshi; Tamoto, Koji; and Iwasaki, Masayuki, 4,511,645, Cl. 430-276.000.
Iwatani, Akitoshi, to Ishigaki Kiko Co., Ltd. Filter press of movable twin head type. 4,511,469, Cl. 210-225.000.
Iwayama, Kazuyoshi; Kamano, Takao; Tada, Kuniyuki; and Inoue, Takehisa, to Toray Industries, Incorporated. Process for preparing crystalline aluminosilicate zeolites using a carboxylic acid. 4,511,547, Cl. 423-329.000.
Izu, Masatsugu; and Cannella, Vincent D., to Sovonics Solar Systems. System for eliminating short circuit current paths in photovoltaic devices. 4,510,674, Cl. 29-574.000.
Izu, Masatsugu; and Cannella, Vincent D., to Sovonics Solar Systems. System for eliminating short and latent short circuit current paths in photovoltaic devices. 4,510,675, Cl. 29-574.000.
Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, to Hitachi Construction Machinery Co., Ltd. Circuit pressure control system for hydrostatic power transmission. 4,510,750, Cl. 60-443.000.
Izumi, Takayuki, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for continuous production of optically anisotropic pitch. 4,511,456, Cl. 208-44.000.
J. R. Simplot Company: *See—*
Bierman, Laurence W.; Polinsky, Samuel M.; Hempel, David A.; and Humberger, Roger B., 4,511,541, Cl. 423-100.000.
J. Wagner GmbH: *See—*
Kille, Ewald; and Griebel, Heinrich, 4,511,074, Cl. 227-113.000.
Jackson, Alan D., to Cessna Aircraft Company, The. Outlet metering load-sensing circuit. 4,510,751, Cl. 60-450.000.
Jackson, Lawrence D. A., to Linatex Canada Inc. Variable opening pinch sleeve valve. 4,511,116, Cl. 251-5.000.
Jacobs, Erwin, to Siemens Aktiengesellschaft. Memory cell having a double gate field effect transistor and a method for its operation. 4,511,996, Cl. 365-186.000.
Jacobs Manufacturing Company, The: *See—*
Quenneville, Raymond N., 4,510,900, Cl. 123-321.000.
Jacobsen, Edwin: *See—*
DeAngelis, Barbara; Jacobsen, Howard; and Jacobsen, Edwin, 4,510,888, Cl. 119-143.000.
Jacobsen, Howard: *See—*
DeAngelis, Barbara; Jacobsen, Howard; and Jacobsen, Edwin, 4,510,888, Cl. 119-143.000.
Jacquin, Yves: *See—*
Billon, Alain; Jacquin, Yves; Peries, Jean-Pierre; and Toulhoat, Herve , 4,511,458, Cl. 208-59.000.
Jager, Theo; and Schmid, Helmut. Device for cutting sheet metal and the like. 4,510,831, Cl. 83-157.000.
Jakobsen, Kjell M.; and Nilsson, Claes T., to PLM Aktiebolag. Apparatus for the manufacture of a cup-like article from polyethylene terephthalate or similar material. 4,511,322, Cl. 425-384.000.
Jamain, Patrice C.: *See—*
Caye, Paul D.; Jamain, Patrice C.; and Weisser, Bernard G., 4,511,190, Cl. 308-10.000.
James Howden Australia Pty. Limited: *See—*
Russell, Bruce A.; and Abdel-Fattah, Adnan M., 4,511,308, Cl. 415-191.000.
Jamiolkowski, Dennis D.: *See—*
Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,511,706, Cl. 528-192.000.
Janisiewicz, Stanley W.; and Rose, Emery L., to Universal Instruments Corporation. Gauging method and apparatus for components having leads. 4,510,806, Cl. 73-432.00R.
Jannot, Marcel A. J.: *See—*
Boy-Marcotte, Jean-Louis; Dahan, Gilbert M. I.; Dancette, Michel; Le Nabour, Marcel P.; Pellerin, Jean-Francois G. A.; Rivallin, Jose ; and Jannot, Marcel A. J., 4,511,805, Cl. 290-2.000.
Janowicz, Andrew H.: *See—*
Bergman, Robert G.; Janowicz, Andrew H.; and Perians-Pillai, Roy A., 4,511,745, Cl. 570-241.000.
Jansen, Friedrich W., to P.J. Industrial Safety Elec. Co. Ltd. Forced air distributor for baseboard heater. 4,511,786, Cl. 219-364.000.
Janssen, Donovan M.: *See—*
Ashbee, William H.; Janssen, Donovan M.; Martin, Ronald J.; and Seaward, William S., 4,511,242, Cl. 355-14.00C.
Japan Bano'k Co., Ltd.: *See—*
Furutsu, Akira, 4,511,073, Cl. 227-67.000.
Japan Synthetic Rubber Co., Ltd.: *See—*
Shinohara, Hironobu; Yamahara, Noboru; and Yoshida, Yoshinori, 4,511,683, Cl. 524-3.000.
Jennings, Charles E.; Barrington, Claud C.; Chen, Lien-Yan; Hopkins, Bob C.; McIntyre, John N.; and Regitz, Alfred P., to FMC Corporation. Valve stem-to-bonnet backseat. 4,510,960, Cl. 137-75.000.
Jentzsch, Arndt: *See—*
Forster, Karl-Heinz; Schuck, Helmut; Johne, Hans; and Jentzsch, Arndt, 4,510,867, Cl. 101-365.000.
Jergens, Inc.: *See—*
Schron, Jack H.; and Seidel, Lawrence H., 4,511,127, Cl. 269-32.000.
Jessup, Peter: *See—*
Holstedt, Richard A.; Baron, Kenneth; and Jessup, Peter, 4,511,516, Cl. 260-462.00R.
Jetline Engineering, Inc.: *See—*
Arter, William L.; and Williams, Foster R., 4,511,785, Cl. 219-124.340.
Jobe, A. Louise. Parasite control bath unit. 4,510,889, Cl. 119-159.000.
Jobsis, Frans F.; Keizer, Hans H.; and Overaker, Ronald F., to Duke University, Inc. Body-mounted light source-detector apparatus. 4,510,938, Cl. 128-633.000.
Johansson, Allan A.: *See—*
Tournier, Herve; Johansson, Allan A.; Sachetto, Jean-Pierre; Armanet, Jean-Michel; Michel, Jean-Pierre; and Roman, Alain, 4,511,433, Cl. 162-16.000.
John Fluke Mfg. Co., Inc.: *See—*
Eng, Benjamin, Jr., 4,511,856, Cl. 330-297.000.
Johne, Hans: *See—*
Forster, Karl-Heinz; Schuck, Helmut; Johne, Hans; and Jentzsch, Arndt, 4,510,867, Cl. 101-365.000.
Johns Hopkins University, The: *See—*
Miller, Paul S.; and Ts'O, Paul O. P., 4,511,713, Cl. 536-27.000.
Johnson, Barbara: *See—*
Johnson, Clifford B., Jr.; Johnson, Barbara; Amadio, Alex; and Amadio, Williane, 4,511,358, Cl. 604-327.000.
Johnson, Clifford B., Jr.; Johnson, Barbara; Amadio, Alex; and Amadio, Williane. Urine bag carrier with a stretchable front panel. 4,511,358, Cl. 604-327.000.
Johnson, Dale A.: *See—*
Bulle, Marshall R.; and Johnson, Dale A., 4,511,121, Cl. 254-50.400.
Johnson & Johnson Baby Products Company: *See—*
Guth, Jacob J.; and Verdicchio, Robert J., 4,511,513, Cl. 260-404.500.
Johnson Matthey Public Limited Company: *See—*
Stephenson, David J., 4,511,539, Cl. 422-311.000.
Johnson, Ronald L., to General Electric Company. Automotive type air conditioning system and method of operating such. 4,510,763, Cl. 62-115.000.
Johnson, William N. Boot or shoe incorporating pedometer or the like. 4,510,704, Cl. 36-136.000.
Johnston, Paul M., to Westinghouse Electric Corp. Electronic display apparatus using time multiplexed data and control signals. 4,511,894, Cl. 340-756.000.
Jones, Arthur A., to Nautilus Sports/Medical Industries, Inc. Compound weight lifting exercising machine. 4,511,137, Cl. 272-118.000.
Jones, Charles E., to Moore Business Forms, Inc. Protective binder. 4,511,298, Cl. 412-34.000.
Jones, Dennis J.; and Kunz, Gary L., to Hart-Carter Company. Chaffer slat. 4,511,466, Cl. 209-395.000.
Jones, Donald W.: *See—*
Miller, Timothy J. E.; Jones, Donald W.; and Kalan, Gary L., 4,510,680, Cl. 29-598.000.
Jones, Ronald: *See—*
Drake, Cyril F.; Jones, Ronald; Bateson, Paul F.; Grant, Ronald J.; and Burrage, Martin E., 4,511,404, Cl. 106-14.120.
Jones, Thomas M.; and Kendrick, Lucian A., Jr., to Tennessee Valley Authority. Production of high-analysis ammonium orthophosphate suspension fertilizers by a new batch-type process. 4,511,388, Cl. 71-34.000.
Jooss, Hans: *See—*
Ehrlich, Willibald; Jooss, Hans; and Hornung, Rainer, 4,511,606, Cl. 427-386.000.
Jordan, Hans-Peter: *See—*
Klein, Wilhelm; Koske, Jorg; Herzog, Siegfried; Jordan, Hans-Peter; Bauer, Wilhelm; Bausch, Max; and Grabner, Christian, 4,511,214, Cl. 350-632.000.
Jordan, Thomas L.: *See—*
Goffman, Martin; and Jordan, Thomas L., 4,511,443, Cl. 204-108.000.
Jorgensen, Ib Greve H.: *See—*
Pedersen, Karsten; Rostrup-Nielsen, Jens R.; and Jorgensen, Ib Greve H., 4,511,674, Cl. 518-714.000.
Jost, Bernhard. Installation for exploiting water currents in flowing waters by means of a plurality of water wheels. 4,511,808, Cl. 290-54.000.
Jovy, Herbert; and Schuster, Wilhelm, to Ermital AG. Method of flushing a water closet. 4,510,629, Cl. 4-332.000.
Joy Manufacturing Company: *See—*
Haynes, Charles W., 4,511,168, Cl. 294-102.200.
Young, Terry G., 4,510,970, Cl. 137-625.400.
Juelke, Charles V.: *See—*
Lee, Fui-Tseng H.; Juelke, Charles V.; and Finley, Joseph H., 4,511,498, Cl. 252-609.000.

Jung, Thomas; and Heidemann, Gerhard, to Norton Christensen, Inc. Locking device for a tool with telescopically displaceable parts. 4,511,007, Cl. 175-297.000.
Jury, Harold R., to Ampliform Pty. Ltd. Grid supported structure. 4,510,727, Cl. 52-508.000.
Kaack, Hermann: *See—*
Baumann, Hans; and Kaack, Hermann, 4,511,506, Cl. 534-631.000.
Kabushika Kaisha Ishida Koki Seisakusho: *See—*
Kataoka, Koichi, 4,511,009, Cl. 177-1.000.
Kabushiki Kaisha Daini Seikosha: *See—*
Horiuchi, Teruo, 4,511,259, Cl. 368-10.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See—*
Kanazawa, Jitsuo, 4,510,813, Cl. 73-766.000.
Sashiki, Takashi; and Sakaeda, Keiko, 4,511,010, Cl. 177-25.000.
Kabushiki Kaisha Kobe Seiko Sho: *See—*
Tokutake, Kunihiko; Mizokami, Nobuo; and Tanaka, Hiroyuki, 4,510,807, Cl. 73-432.00R.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Ishino, Yoshitane; Naruse, Toshihisa; and Sawano, Toshiyuki, 4,510,705, Cl. 37-54.000.
Sasamoto, Tatsuya, 4,511,186, Cl. 305-57.000.
Tomioka, Kunio; Tokai, Shigeru; and Tsuchida, Tatsuo, 4,510,789, Cl. 72-442.000.
Kabushiki Kaisha Takuma: *See—*
Shigaki, Masanobu, 4,510,873, Cl. 110-289.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Kawabata, Susumu; Inoue, Tetsuzo; Miyamoto, Noriaki; Shibuya, Masanobu; and Kaneko, Masashi, 4,510,745, Cl. 57-415.000.
Mori, Mitsuo; Suzuki, Yoshihisa; Muramatsu, Shigeru; and Takasu, Sigeru, 4,510,648, Cl. 19-266.000.
Nakane, Masao; Takahashi, Motohiko; and Ogawa, Takaki, 4,511,974, Cl. 364-463.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Kawabata, Susumu; Inoue, Tetsuzo; Miyamoto, Noriaki; Shibuya, Masanobu; and Kaneko, Masashi, 4,510,745, Cl. 57-415.000.
Kadaba, Pankaja K., to University of Kentucky Research Foundation, The. Triazoline anticonvulsant drugs. 4,511,572, Cl. 514-340.000.
Kagi, Bruno, to Bachofen AG. Pressure-medium-driven linear driving arrangement. 4,510,845, Cl. 91-180.000.
Kai, Masami: *See—*
Tsudaka, Hideaki; Washio, Takaji; Kozuka, Nobuhiko; Iseki, Masahide; Watanabe, Toshio; Kai, Masami; Yoshiyama, Toshio; and Sakata, Hiromi, 4,511,241, Cl. 355-14.0CU.
Kaiser Aluminum & Chemical Corporation: *See—*
Anjier, Joseph L.; Roberson, Morris L.; and Atchison, William E., 4,511,542, Cl. 423-127.000.
Hsu, Yu-Wen, 4,510,784, Cl. 72-201.000.
Kajiya, Seitaro: *See—*
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,511,574, Cl. 514-371.000.
Kakino, Shigeru; Hattori, Katsuhide; Fukatsu, Yoshiaki; Moriyama, Hideo; and Sakakibara, Hidekazu, to Nippon Oil and Fats Co. Ltd. Method of producing a water-in-oil emulsion exposive. 4,511,412, Cl. 149-109.600.
Kakino, Shigeru: *See—*
Matsui, Fumio; Aono, Shin; Sakai, Hiroshi; Hattori, Katsuhide; and Kakino, Shigeru, 4,511,414, Cl. 149-109.600.
Kako, Yutaka: *See—*
Takahashi, Kazue; Okuna, Kenzi; Nakajima, Isao; Harada, Mineo; and Kako, Yutaka, 4,511,269, Cl. 400-124.000.
Kalan, Gary L.: *See—*
Miller, Timothy J. E.; Jones, Donald W.; and Kalan, Gary L., 4,510,680, Cl. 29-598.000.
Kalat, Edwin F., to Pharmasol Corporation, The. Dispensing system. 4,511,069, Cl. 222-263.000.
Kalman, Tibor. Method for sculpting paperweight of attractive appearance. 4,511,630, Cl. 428-542.200.
Kalvinskas, John J.: *See—*
Ravindram, Maddury; and Kalvinskas, John J., 4,511,362, Cl. 44-1.0SR.
Kamano, Takao: *See—*
Iwayama, Kazuyoshi; Kamano, Takao; Tada, Kuniyuki; and Inoue, Takehisa, 4,511,547, Cl. 423-329.000.
Kampichler, Gunter, to Robert Bosch GmbH. Method for mounting at least one single-cylinder plug-in fuel injection pump on a diesel internal combustion engine. 4,510,796, Cl. 73-119.00A.
Kanazawa, Jitsuo, to Kabushiki Kaisha Ishida Koki Seisakusho. Temperature compensation circuit for strain gauges. 4,510,813, Cl. 73-766.000.
Kanbe, Junichiro; and Hosono, Nagao, to Canon Kabushiki Kaisha. Developing device. 4,511,239, Cl. 355-3.0DD.
Kanbe, Mitsuru, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Liquid metal mechanical pump. 4,511,315, Cl. 417-366.000.
Kanda, Hiroshi; and Ishikawa, Isao, to Hitachi, Ltd. Ultrasonic microscope. 4,510,810, Cl. 73-606.000.
Kanda, Hiroshi; Ishikawa, Isao; and Kondo, Toshio, to Hitachi, Ltd. Multielement acoustic transducer as well as a method of manufacturing the same and an acoustic imaging instrument. 4,511,998, Cl. 367-11.000.
Kaneko, Masashi: *See—*
Kawabata, Susumu; Inoue, Tetsuzo; Miyamoto, Noriaki; Shibuya, Masanobu; and Kaneko, Masashi, 4,510,745, Cl. 57-415.000.
Kang, Jung W.; and Davis, James A., to Firestone Tire & Rubber Company, The. Rubber articles having improved metal adhesion and metal adhesion retention employing bis(2-mercaptobenzothiazato) nickel. 4,511,628, Cl. 428-457.000.
Kano , Yoshiharu; Fujisawa, Makoto; Nojiri, Shoji; and Tanaka, Yoshikazu, to Fujitsu Limited. Digital time-division switch. 4,512,015, Cl. 370-110.100.
Kansas State University Research Foundation: *See—*
Lambert, Jack L.; and Chiang, Yuan C., 4,511,658, Cl. 436-130.000.
Kantner, Robert F., to International Business Machines Corp. Emulation of special purpose magnetic tape data recording equipment by a general purpose processor. 4,511,963, Cl. 364-200.000.
Kanzaki Paper Mfg. Co., Ltd.: *See—*
Arai, Naoto, 4,511,909, Cl. 346-208.000.
Kaplan, Martin L.: *See—*
Forrest, Stephen R.; Kaplan, Martin L.; Schmidt, Paul H.; and Venkatesan, Thirumalai N. C., 4,511,445, Cl. 204-158.0HE.
Karg, Roland; and Sattelmaier, Helmut, to Ytron Dr. Karg GmbH. Apparatus for the continuous mixing of pulverulent substances with liquids. 4,511,256, Cl. 366-165.000.
Karin, Michael: *See—*
Fogel, Seymour; Welch, Juliet W.; and Karin, Michael, 4,511,652, Cl. 435-29.000.
Karl Schmidt GmbH: *See—*
Bauer, Wolfgang; and Grosser, Werner, 4,510,821, Cl. 74-552.000.
Karliner, Rudy R.; and Peterson, Gerald E., to Wagner Spray Tech Corporation. Masking tape applicator. 4,511,427, Cl. 156-523.000.
Karpiloff, Kenneth M., to Duracell Inc. Method for making decorated battery casings. 4,511,416, Cl. 156-69.000.
Kasai, Yoshihiko, to Fujitsu Limited. Ceramic resonator and a ceramic filter using the same. 4,511,202, Cl. 333-189.000.
Kasper, James R.; and Opsahl, Allan W., to Boeing Company, The. Powered outward-opening cargo door. 4,510,714, Cl. 49-249.000.
Kasschau, Kenneth. Through-hub exhaust propeller assembly. 4,511,339, Cl. 440-89.000.
Kast, Howard B., to General Electric Company. Shear-type fail-fixed servovalve. 4,510,848, Cl. 91-461.000.
Kasuga, Takuzo; Takahashi, Katsuhiko; and Suzuki, Kunio, to Polyplastics Company, Ltd. Process for manufacturing polytetramethylene terephthalate. 4,511,708, Cl. 528-274.000.
Katakura, Hiroshi: *See—*
Kawata, Shun; Nosaka, Isao; and Katakura, Hiroshi, 4,511,237, Cl. 355-3.00R.
Kataoka, Koichi, to Kabushika Kaisha Ishida Koki Seisakusho. Combinatorial weighing apparatus and method. 4,511,009, Cl. 177-1.000.
Katsura, Tadashi: *See—*
Minai, Masayoshi; and Katsura, Tadashi, 4,511,655, Cl. 435-149.000.
Katsurai, Junji: *See—*
Maeda, Masatoshi; Katsurai, Junji; and Ikeda, Hiroaki, 4,511,929, Cl. 358-296.000.
Katsuyama, Akira: *See—*
Kimura, Shuichi; and Katsuyama, Akira, 4,512,003, Cl. 369-45.000.
Katz, Philip: *See—*
Brenman, Henry S.; Katz, Philip; and Singer, Mark, 4,510,939, Cl. 128-639.000.
Kauer, James C., to Du Pont de Nemours, E. I., and Company. Aralkylcarbamoyl peptide alcohols. 4,511,390, Cl. 71-88.000.
Kausche, Helmold: *See—*
Moeller, Matthias; and Kausche, Helmold, 4,511,756, Cl. 136-258.000.
Kauss, Wolfgang: *See—*
Mucheyer, Norbert; and Kauss, Wolfgang, 4,510,847, Cl. 91-461.000.
Kawabata, Susumu; Inoue, Tetsuzo; Miyamoto, Noriaki; Shibuya, Masanobu; and Kaneko, Masashi, to Kabushiki Kaisha Toyota Chuo Kenkyusho; and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Open-end spinning unit. 4,510,745, Cl. 57-415.000.
Kawaguchi, Masayuki: *See—*
Watanabe, Nobuatsu; Nakajima, Tsuyoshi; and Kawaguchi, Masayuki, 4,511,493, Cl. 252-507.000.
Kawaguchi, Munetaka; Nakabayashi, Hirohiko; and Miyake, Masayoshi, to Sumitomo Electric Industries, Ltd. Enameled wires. 4,511,624, Cl. 428-379.000.
Kawaguchi, Nobuichi, legal representative: *See—*
Kawaguchi. Yukio, deceased; and Kawaguchi, Nobuichi, legal representative, 4,511,833, Cl. 318-696.000.
Kawaguchi, Takehiko, to Taiyo Sanso Kabushiki Kaisha. Detachable holder for containers. 4,511,167, Cl. 294-28.000.
Kawaguchi, Yukio, deceased; and Kawaguchi, Nobuichi, legal representative, to Tokyo Electric Co., Ltd. Stepping motor driving circuit. 4,511,833, Cl. 318-696.000.
Kawahira, Hiroto, to Mitsubishi Denki Kabushiki Kaisha. Heat exchanger and fan motor in a front wheel drive vehicle. 4,510,991, Cl. 165-41.000.
Kawai, Seiji; and Matsumoto, Dairiku, to Meidensha Electric Mfg. Co., Ltd. Manipulator. 4,511,305, Cl. 414-755.000.
Kawakami, Kanji: *See—*
Shimada, Satoshi; Murayama, Ken; Kobori, Shigeyuki; and Kawakami, Kanji, 4,511,878, Cl. 338-4.000.
Kawamoto, Tamio; and Hiraiwa, Kazuyoshi, to Nissan Motor Company, Limited. Gear operating mechanism of an automotive manual transmission. 4,510,817, Cl. 74-477.000.
Kawamura, Hideaki: *See—*
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Miyata, Mitsuto, 4,511,975, Cl. 364-474.000.
Kawamura, Hideo, to Isuzu Motors Limited. Voltage control circuit for protecting glow plug from overheating. 4,511,792, Cl. 219-499.000.

Kawano, Hikaru; Sato, Koji; and Nogi, Hiroyoshi, to Musashi Co., Ltd.; and Hitachi Engineering Kabushiki Kaisha. Clamp device for paper sheet bundles in a paper sheet counting and bandsealing apparatus. 4,511,301, Cl. 414-43.000.

Kawasaki Steel Corporation: *See*—
Ebata, Sadao; and Bando, Seiji, 4,511,089, Cl. 239-553.300.

Kawata, Ken: *See*—
Hirai, Hiroyuki; and Kawata, Ken, 4,511,650, Cl. 430-559.000.

Kawata, Shun; Nosaka, Isao; and Katakura, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Electrophotographic reproducing machine. 4,511,237, Cl. 355-3.00R.

Kawazura, Hiroshi: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,511,574, Cl. 514-371.000.

Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, to Sumitomo Chemical Company, Limited. Monoazo compound having both monochlorotriazinyl and vinylsulfone type reactive groups. 4,511,507, Cl. 534-629.000.

Kazami, Kazuyuki; and Ohtsubo, Yoshiaki, to Nippon Kogaku K.K. Charge control device in a flash device for a camera. 4,511,233, Cl. 354-418.000.

KDI American Products, Inc.: *See*—
Spinnett, Raymond G., 4,510,967, Cl. 137-389.000.

Keizer, Hans H.: *See*—
Jobsis, Frans F.; Keizer, Hans H.; and Overaker, Ronald F., 4,510,938, Cl. 128-633.000.

Kellar, John D.; and Pereman, Gordon F., to PPG Industries, Inc. Deformable vacuum holder used to shape glass sheets. 4,511,386, Cl. 65-273.000.

Kellar, John D.; and Pereman, Gordon F., to PPG Industries, Inc. Vacuum holder with anti-bulging means used to shape glass sheets. 4,511,387, Cl. 65-287.000.

Keller, Alex J.; and Pinto, Akiva. Method and apparatus for controlling fiber density. 4,510,647, Cl. 19-105.000.

Keller, Keith T. Method of manufacturing a piano plate assembly and the assembly. 4,510,837, Cl. 84-184.000.

Keller, Lewis C.: *See*—
Fitzwater, Margaret; and Keller, Lewis C., 4,511,586, Cl. 426-144.000.

Keller, Paul. Adjustable ice breaker for an ice machine producing sheet ice. 4,510,768, Cl. 62-320.000.

Kelley, Joe A.: *See*—
Outlaw, Benjamin T.; Oude Alink, Bernardus A.; Kelley, Joe A.; and Claywell, Carol S., 4,511,480, Cl. 252-8.55E.

Kendall Company, The: *See*—
Semrow, Carolyn M.; Kolstedt, Mark W.; and Dunn, William J., 4,510,941, Cl. 128-671.000.
Steigerwald, Carl J., 4,511,357, Cl. 604-323.000.

Kendrick, Lucian A., Jr.: *See*—
Jones, Thomas M.; and Kendrick, Lucian A., Jr., 4,511,388, Cl. 71-34.000.

Kennedy, Donald: *See*—
Duval, Henry H.; Kennedy, Donald; and Muesse, Milton J., 4,511,283, Cl. 404-107.000.

Kenney, Donald M., to International Business Machines Corporation. Dense dynamic memory cell structure and process. 4,511,911, Cl. 357-23.600.

Kent, Henry R., to Maxwell Laboratories, Inc. Winding apparatus. 4,511,094, Cl. 242-7.080.

Keren, Yehuda; Carmon, Shmuel; Behar, Meyer; and Axelrod, Shimshon, to Negev Phosphates Ltd. Method for beneficiation of phosphate rock. 4,511,543, Cl. 423-167.000.

Keritsis, Gus D.; and Nichols, Walter A., to Philip Morris Incorporated. Foamed, extruded, tobacco-containing smoking article and method of making same. 4,510,950, Cl. 131-353.000.

Kerotest Manufacturing Corp.: *See*—
Conley, Richard W.; Tremblay, Richard P.; Bolam, Charles W.; Logan, James E.; and Krueger, David A., 4,511,120, Cl. 251-288.000.

Kerr Glass Manufacturing Corporation: *See*—
Shank, Brian E., 4,511,054, Cl. 215-252.000.

Ketchum, Lloyd H., Jr.: *See*—
Colaruotolo, Joseph F.; Irvine, Robert L.; Ketchum, Lloyd H., Jr.; and Ying, Wei-chi, 4,511,657, Cl. 435-253.000.

Key, Clyde. Wall-patch adapter. 4,510,728, Cl. 52-514.000.

Key Pharmaceuticals, Inc.: *See*—
Tuttle, Ronald R., 4,511,570, Cl. 514-282.000.

Keyes, Marion A., IV; and Thompson, William L., to Babcock & Wilcox Company, The. Function generator. 4,511,882, Cl. 340-347.0DD.

Khramtsov, Alexandr A.; Tsyrkin, Mikhail I.; and Shinder, Ilya E. Apparatus for synchronizing actuators. 4,510,849, Cl. 91-515.000.

Kidde Consumer Durables Corp.: *See*—
Rummelsburg, Al S., 4,511,077, Cl. 228-228.000.

Kido, Yoshinobu: *See*—
Tsuchida, Tsuyoshi; and Kido, Yoshinobu, 4,510,902, Cl. 123-325.000.

Kille, Ewald; and Griebel, Heinrich, to J. Wagner GmbH. Electrically-operated manual device. 4,511,074, Cl. 227-113.000.

Killingsworth, Emmett D., to Westinghouse Electric Corp. Meter encoding register with tapered aperture in baffle insert. 4,511,798, Cl. 250-231.0SE.

Kim, Jung T.: *See*—
Saprokhin, Alexander M.; Friedland, David J.; Baran, Richard M.; Kim, Jung T.; and McCurry, Lynn E., 4,511,440, Cl. 204-60.000.

Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, to Asahi Kasei Kogyo Kabushiki Kaisha. Perfluorinated fluorosulfonylalkyleneoxy-2-propanoyl fluoride and hexafluoroepoxide addition compounds. 4,511,518, Cl. 260-543.00F.

Kimura, Shuichi; and Katsuyama, Akira, to Sony Corporation. Control circuitry for preliminary focusing of light on a record medium surface in an optical reproducing apparatus. 4,512,003, Cl. 369-45.000.

King, Lorraine. Walking aid, particularly for handicapped persons. 4,510,956, Cl. 135-67.000.

King, William. Reeling device. 4,511,101, Cl. 242-107.700.

Kinoshita, Shigeo: *See*—
Hayashi, Hideki; Ito, Yukio; Akiike, Yukio; and Kinoshita, Shigeo, 4,511,103, Cl. 242-186.000.

Kintzel, Gerhard; and Heilmann, Edmund, to SKF Kugellagerfabriken GmbH. Clamping device for tool assemblies. 4,510,829, Cl. 82-36.00R.

Kinugawa Rubber Industrial Co., Ltd.: *See*—
Yamaguchi, Toshiaki, 4,511,526, Cl. 264-129.000.

Kirby, Christopher G. M.: *See*—
Dauphinee, Thomas M.; and Kirby, Christopher G. M., 4,511,845, Cl. 324-444.000.

Kirin Beer Kabushiki Kaisha: *See*—
Nakayama, Toshikazu, 4,511,025, Cl. 198-377.000.

Kirk, Donald, Jr.: *See*—
Forgey, James; and Kirk, Donald, Jr., 4,511,919, Cl. 358-120.000.

Kirk, Kenneth H.: *See*—
Fedde, George A.; and Kirk, Kenneth H., 4,510,683, Cl. 29-701.000.

Kis-Tamas, Attila: *See*—
Budai, Zoltan; Kis-Tamas, Attila; Mezei, Tibor; Lay, Aranka; Vigh, Zoltan; and Sokorai, Agnes, 4,511,737, Cl. 564-257.000.

Kishida, Katsuji; Ueno, Tetsuto; Onishi, Masakazu; and Oda, Keijiro, to Toyo Rubber Industry Co., Ltd., The. Pneumatic radial tire having durable bead structure. 4,510,984, Cl. 152-362.0CS.

Kishida, Toshio, to Clarion Co., Ltd. Automatic linearity correcting circuit. 4,511,854, Cl. 330-279.000.

Kishino, Kohji, to Toyo Kogyo Co., Ltd. Quarter-window structure for vehicle. 4,511,129, Cl. 296-146.000.

Kishiro, Osamu: *See*—
Tanaka, Toru; Gohko, Nobuaki; Kishiro, Osamu; and Murakami, Atsushi, 4,511,704, Cl. 526-125.000.

Kita, Yasuhiro: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,511,990, Cl. 364-748.000.

Kita, Yuzo: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,511,990, Cl. 364-748.000.

Kitada, Hisao. Vacuum floor polisher. 4,510,643, Cl. 15-320.000.

Kitamura, Masayuki, to Koyo Seike Company Limited. Anticreep device for annular member. 4,511,191, Cl. 384-536.000.

Kitazawa, Yoichi: *See*—
Ohkuni, Shinichiro; and Kitazawa, Yoichi, 4,510,983, Cl. 152-361.00R.

Kittaka, Toshihiko: *See*—
Ogawa, Toshio; and Kittaka, Toshihiko, 4,511,483, Cl. 252-62.900.

Klatt, Alfred, to WABCO Westinghouse Fahrzeugbremsen GmbH. Accelerator pedal mechanism for optimizing fuel economy. 4,510,906, Cl. 123-396.000.

Klaus, Gersmann, to Bayerische Motoren Werke AG. Headrest in passenger cars. 4,511,180, Cl. 297-408.000.

Kleber, Heinrich: *See*—
Sitte, Helmuth; Cooper, Terry W.; and Kleber, Heinrich, 4,511,224, Cl. 350-523.000.

Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, to Degussa Aktiengesellschaft. Nα-(3-Cyanopropanoyl)-aminocarboxylic acid derivatives and their use. 4,511,719, Cl. 546-245.000.

Klein, Howard J.; and Szekeres, Gabor L. Container seal with tamper indicator. 4,511,052, Cl. 215-230.000.

Klein, Wilhelm; Koske, Jorg; Herzog, Siegfried; Jordan, Hans-Peter; Bauer, Wilhelm; Bausch, Max; and Grabner, Christian, to Daimler-Benz Aktiengesellschaft. Fairing which folds flat independantly of its mirror. 4,511,214, Cl. 350-632.000.

Klemm, Gerhard. Screen printing machine. 4,510,864, Cl. 101-123.000.

Klimo, Robert G., to Invacare Corporation. Electric wheelchair with improved control circuit. 4,511,825, Cl. 318-67.000.

Klipper, Reinhold: *See*—
Krimm, Heinrich; Buysch, Hans-Josef; Lange, Peter M.; and Klipper, Reinhold, 4,511,722, Cl. 548-231.000.

Klockner-Becorit GmbH: *See*—
Lubojatzki, Walter, 4,511,290, Cl. 405-292.000.

Klockner-Humboldt-Deutz AG: *See*—
Klotmann, Fred; and Filges, Ralf, 4,511,266, Cl. 384-441.000.
Kunze, Oswald, 4,511,333, Cl. 432-106.000.

Klotmann, Fred; and Filges, Ralf, to Klockner-Humboldt-Deutz AG. Arrangement for mounting a bearing ring on a rotary cylinder. 4,511,266, Cl. 384-441.000.

Knapp, Gordon G., to Ethyl Corporation. Corrosion inhibitors for alcohol containing motor fuel. 4,511,367, Cl. 44-53.000.

Knapp, Gordon G., to Ethyl Corporation. Corrosion inhibitors for alcohol-based fuels. 4,511,368, Cl. 44-53.000.

Knifton, John F.: *See*—
Alexander, David C.; and Knifton, John F., 4,511,740, Cl. 568-454.000.

Knoll, Jimmie L.: *See*—
Ingermann, Donald E.; Smith, Ronald L.; Knoll, Jimmie L.; Caffrey, Stephen F.; Barsi, Endre; and Dechant, Joseph C., 4,510,642, Cl. 15-231.000.

Knothe, Herbert; and Roschmann, Klaus, to Teldec Telefunken-Decca-Schallplatten GmbH. Method for producing a record carrier. 4,512,007, Cl. 369-127.000.

Knott, Joseph; and Kopp, Walter, to Siemens Aktiengesellschaft. Method for regenerating the carrier particles of a two-component developer consisting of carrier particles and toner. 4,511,639, Cl. 430-108.000.

Knox, Howard: *See*—
Prete, Ernest, Jr.; and Knox, Howard, 4,510,651, Cl. 24-68.00R.

Kobayashi, Chikara: *See*—
Ohkoshi, Tatsuo; and Kobayashi, Chikara, 4,511,093, Cl. 241-60.000.

Kobayashi, Kesanao: *See*—
Koike, Mitsuru; Kobayashi, Kesanao; Toyama, Tadao; Misu, Hiroshi; Tamoto, Koji; and Iwasaki, Masayuki, 4,511,645, Cl. 430-276.000.

Kobayashi, Masahito: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,511,990, Cl. 364-748.000.

Kobayashi, Sadame: *See*—
Iijima, Yukihiko; and Kobayashi, Sadame, 4,511,920, Cl. 358-139.000.

Kobayashi, Yoji: *See*—
Natori, Takeshi; Kobayashi, Yoji; Watanabe, Shigetaka; Shimizu, Katsumi; Matsumura, Ikuei; Namekawa, Yoshihiro; and Miyanaga, Satoshi, 4,510,974, Cl. 138-137.000.

Kobori, Shigeyuki: *See*—
Shimada, Satoshi; Murayama, Ken; Kobori, Shigeyuki; and Kawakami, Kanji, 4,511,878, Cl. 338-4.000.

Koch, Lehel: *See*—
Szendrei, Kalman; Minker, Emil; Rozsa, Zsuzsanna; Koch, Lehel; and Wolf, Lajos, 4,511,559, Cl. 514-54.000.

Kochi, Ikuyoshi: *See*—
Konoki, Keizo; Shinohara, Takanobu; Kochi, Ikuyoshi; Shibata, Keiichi; Nishihara, Hisakatsu; Morichika, Toshiaki; Sugitani, Junichi; and Tsuchida, Koji, 4,510,988, Cl. 164-102.000.

KOCKUMS Industri AB: *See*—
Biller, Sven-Olov, 4,510,981, Cl. 144-246.00F.

Kocsis, Maria: *See*—
Gorog, Katalin; Dudar, Erzebet; Gardi, Ivan; Kocsis, Maria; Gaal, Sandor; and Tasnadi, Marta, 4,511,714, Cl. 548-215.000.

Koeijmans, Gerard D.: *See*—
Bowden, Edgar A.; Deline, Gordon R.; and Koeijmans, Gerard D., 4,511,999, Cl. 367-23.000.

Koenig, Mark J.; and Oye, Kevin J., to AT&T Information Systems Inc. Control channel interface circuit. 4,511,969, Cl. 364-200.000.

Koflo Corporation: *See*—
Federighi, James L.; and Federighi, Frank F., 4,511,258, Cl. 366-337.000.

Kohler, Hans O.; and Stromvall, Sten K., to Kohler, Hans Olof. Determining agreement between an analysis signal and at least one reference signal. 4,511,917, Cl. 358-84.000.

Kohler, Hans Olof: *See*—
Kohler, Hans O.; and Stromvall, Sten K., 4,511,917, Cl. 358-84.000.

Kohler, Rolf-Dieter: *See*—
Hagen, Helmut; Markert, Juergen; Kohler, Rolf-Dieter; and Wuerzer, Bruno, 4,511,393, Cl. 71-92.000.

Koike, Mitsuru; Kobayashi, Kesanao; Toyama, Tadao; Misu, Hiroshi; Tamoto, Koji; and Iwasaki, Masayuki, to Fuji Photo Film Co., Ltd. Photosensitive plate for lithographic printing plate. 4,511,645, Cl. 430-276.000.

Kokawa, Katsuzo: *See*—
Ogino, Toshiro; and Kokawa, Katsuzo, 4,511,327, Cl. 431-201.000.

Kokiso, Masakazu: *See*—
Seimiya, Ryubun; Tarumi, Noriyoshi; Kokiso, Masakazu; and Tsuchiya, Hiroshi, 4,511,622, Cl. 428-323.000.

Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, to Laurel Bank Machine Co., Ltd. Device for securely holding stacked bank notes for use in an automatic money depositing and disbursing machine. 4,511,133, Cl. 271-3.100.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Konishi, Kazunori; and Kurematsu, Akira, 4,511,758, Cl. 178-2.00B.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Yamazaki, Yasuhiro; and Endo, Toshiaki, 4,511,213, Cl. 358-261.000.

Kolff, Willem J., to University of Utah. Artificial heart valve made by vacuum forming technique. 4,510,628, Cl. 3-1.500.

Koller, Thomas J., to Tektronix, Inc. Simplified paper loading mechanism. 4,511,235, Cl. 355-1.000.

Kollmorgen Technologies Corporation: *See*—
Teng, Yu-Ling; and Mayernik, Richard, 4,511,597, Cl. 427-53.100.

Kolodesh, Michael S.; Peters, Edward L.; and Madgett, Raymond J., to Procter & Gamble Company, The. Dough rolling apparatus for laminated cookies. 4,511,318, Cl. 425-133.100.

Kolstedt, Mark W.: *See*—
Semrow, Carolyn M.; Kolstedt, Mark W.; and Dunn, William J., 4,510,941, Cl. 128-671.000.

Komai, Kensaku: *See*—
Mochizuki, Daisuke; Ohnishi, Souichi; and Komai, Kensaku, 4,512,027, Cl. 377-16.000.

Komatsu, Fumiaki; Saegusa, Kazuyuki; Seshimo, Yu; and Yamashita, Norio, to Mitsubishi Denki Kabushiki Kaisha. Cold storage and refrigeration system. 4,510,767, Cl. 62-200.000.

Komatsu, Hideo: *See*—
Mizutani, Tatsumi; Ohgata, Toshihide; and Komatsu, Hideo, 4,511,429, Cl. 156-643.000.

Komatsu, Michiyasu: *See*—
Tsuge, Akihiko; Komatsu, Michiyasu; Inoue, Hiroshi; and Komeya, Katsutoshi, 4,511,525, Cl. 264-65.000.

Komeda, Kenichiro: *See*—
Sumitani, Toshihiko; and Komeda, Kenichiro, 4,511,138, Cl. 273-1.00E.

Komeya, Akira: *See*—
Yoshida, Hiroshi; Matsuda, Yoshio; and Komeya, Akira, 4,510,656, Cl. 24-390.000.

Komeya, Katsutoshi: *See*—
Tsuge, Akihiko; Komatsu, Michiyasu; Inoue, Hiroshi; and Komeya, Katsutoshi, 4,511,525, Cl. 264-65.000.

Komoto, Akira, to Shimadzu Corporation. A-D Converter for use in an electronic balance. 4,511,883, Cl. 340-347.0AD.

Komoto, Shinsuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Reflex zoom lens having aperture scale. 4,511,221, Cl. 350-423.000.

Konaya, Yoshikazu, to Fuji Photo Film Co., Ltd. Film storage device. 4,511,098, Cl. 242-56.00R.

Kondo, Hiroatsu: *See*—
Yamada, Yasuaki; Ozawa, Toshiaki; and Kondo, Hiroatsu, 4,511,830, Cl. 318-318.000.

Kondo, Toshio: *See*—
Kanda, Hiroshi; Ishikawa, Isao; and Kondo, Toshio, 4,511,998, Cl. 367-11.000.

Konishi, Kazunori; and Kurematsu, Akira, to Kokusai Denshin Denwa Co., Ltd. Reduction of message length in a communication system. 4,511,758, Cl. 178-2.00B.

Konishiroku Photo Industry Co., Ltd.: *See*—
Kawata, Shun; Nosaka, Isao; and Katakura, Hiroshi, 4,511,237, Cl. 355-3.00R.
Maeda, Masatoshi; Katsurai, Junji; and Ikeda, Hiroaki, 4,511,929, Cl. 358-296.000.
Seimiya, Ryubun; Tarumi, Noriyoshi; Kokiso, Masakazu; and Tsuchiya, Hiroshi, 4,511,622, Cl. 428-323.000
Yamashita, Kiyoshi; and Iijima, Toshifumi, 4,511,648, Cl. 430-503.000.

Konno, Ryozo; Sugai, Makio; Kubota, Yuichi; Nishimatsu, Masaharu; Isobe, Yukihiro; Tanaka, Kazushi; and Shinoura, Osamu, to TDK Electronics Co., Ltd.; and Toyo Ink Mfg. Co., Ltd. Magnetic recording medium. 4,511,629, Cl. 428-522.000.

Konoki, Keizo; Shinohara, Takanobu; Kochi, Ikuyoshi; Shibata, Keiichi; Nishihara, Hisakatsu; Morichika, Toshiaki; Sugitani, Junichi; and Tsuchida, Koji, to Kubota Ltd.; and Toyo Engineering Corporation. Tube for thermal cracking or reforming hydrocarbon and manufacturing method thereof. 4,510,988, Cl. 164-102.000.

Kopp, Walter: *See*—
Knott, Joseph; and Kopp, Walter, 4,511,639, Cl. 430-108.000.

Koppany, Eniko: *See*—
Mogyorodi, Ferenc; Koppany, Eniko; Bodi, Tibor; Balogh, Karoly; Toth, Istvan; Bognar, Rezso; Makleit, Sandor; Litkei, Gyorgy; Rakosi, Miklos; and Dinya, Zoltan, 4,511,736, Cl. 564-214.000.

Korcz, William H.: *See*—
Durbin, Daniel P.; and Korcz, William H., 4,511,696, Cl. 525-92.000.

Korea Advanced Institute of Science and Technology: *See*—
Yoo, Han S.; and Lee, Wha S., 4,511,709, Cl. 528-331.000.

Korea Advanced Institute of Science and Technology, 200-43: *See*—
Yoon, Han S.; and Son, Tae W., 4,511,623, Cl. 428-359.000.

Korner, Gerhard; Plettner, Horst; Viering, Walter; and Rees, Volker, to BBC Brown, Boveri & Company, Limited. Circuit breaker. 4,511,775, Cl. 200-148.00A.

Korsunsky, Iosif: *See*—
Grabbe, Dimitry G.; and Korsunsky, Iosif, 4,511,197, Cl. 339-17.0CF.

Kosaka, Minoru; and Akiyama, Toru, to Universal Pioneer Corporation. Tracking servo system of recording disc information recording and reproducing apparatus. 4,512,002, Cl. 369-44.000.

Koske, Jorg: *See*—
Klein, Wilhelm; Koske, Jorg; Herzog, Siegfried; Jordan, Hans-Peter; Bauer, Wilhelm; Bausch, Max; and Grabner, Christian, 4,511,214, Cl. 350-632.000.

Kouchi, Takashi; and Tamaoki, Eiki, to Rex Industries Co., Ltd. Control apparatus for metal saw cutter. 4,511,826, Cl. 318-98.000.

Kouzai, Fumio; and Motoki, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Energization indicator for time switch. 4,511,890, Cl. 340-644.000.

Kovacs, Jeno : *See*—
Benko, Pal; Ratz nee Simonek, Ildiko ; Pallos, Laszlo ; Magyar, Karoly; Kovacs, Jeno ; Matrai, Erzsebet; Gundel, Janos; and Balogh, Albert, 4,511,717, Cl. 544-353.000.

Kowalski, Charles I.: *See*—
Nemeth, Joseph; and Kowalski, Charles I., 4,511,524, Cl. 264-61.000.

Kowalski, Edward F.: *See*—
Swidwa, Kenneth J.; Hornak, Leonard P.; and Kowalski, Edward F., 4,511,531, Cl. 376-262.000.

Koyo Seike Company Limited: *See*—
Kitamura, Masayuki, 4,511,191, Cl. 384-536.000.

Kozak, Norman M., to A. O. Smith Corporation. Multiple load control apparatus having load equalization. 4,511,790, Cl. 219-486.000.

Kozponti Valto-es Hitelbank Rt. InnovacioAlap: *See*—
Szendrei, Kalman; Minker, Emil; Rozsa, Zsuzsanna; Koch, Lehel; and Wolf, Lajos, 4,511,559, Cl. 514-54.000.

Kozuka, Nobuhiko: *See*—
Tsudaka, Hideaki; Washio, Takaji; Kozuka, Nobuhiko; Iseki, Masahide; Watanabe, Toshio; Kai, Masami; Yoshiyama, Toshio; and Sakata, Hiromi, 4,511,241, Cl. 355-14.0CU.

Kramer, Dieter; Pennewiss, Horst; Plainer, Hermann; Schnee, Reiner; and Schleier, Waldemar, to Rohm GmbH. Hydrophilic polymer carrier for proteins. 4,511,694, Cl. 525-54.100.

Krause, Andreas: *See*—
Kuhl, Uwe; Krause, Andreas; and Kruger, Horst, 4,511,118, Cl. 251-137.000.

Krause, Glenn C.; and Blounts, Joseph, to Hoddie Corporation, Inc., The. Self supplying hawk. 4,511,063, Cl. 222-75.000.

Krause, William F., Jr.; and Hopmann, Mark E., to Baker Oil Tools, Inc. Downhole locking apparatus. 4,510,995, Cl. 166-217.000.

Krauss-Maffei Aktiengesellschaft: *See*—
Habeck, Reinhold; Mackiol, Norbert; Mautner, Franz; and Schwarzler, Peter, 4,510,871, Cl. 105-167.000.

Kravits, Richard: *See*—
Tatham, Edward J.; Kravits, Richard; Clymer, John C.; and Hoffman, Carvel D., 4,511,801, Cl. 250-394.000.

Kreibiehl, Guenter: *See*—
Mahnke, Harald; Woerner, Frank P.; Weber, Heinz; and Kreibiehl, Guenter, 4,511,678, Cl. 521-52.000.

Kreikebaum, Gerhard: *See*—
Desai, Avinash J.; and Kreikebaum, Gerhard, 4,511,791, Cl. 219-497.000.

Kreuzer, Franz-Heinrich; Glauberman, Gisela; and Bosch, Erhard, to Consortium fur Elektrochemische. Silanes and compositions prepared therefrom. 4,511,728, Cl. 556-419.000.

Krimm, Heinrich; Buysch, Hans-Josef; Lange, Peter M.; and Klipper, Reinhold, to Bayer Aktiengesellschaft. Process for preparing cyclic N-vinylacylamines. 4,511,722, Cl. 548-231.000.

Krishna, Coimbatore R.; and Milau, Julius S., to United States of America, Energy. Cyclone separator having boundary layer turbulence control. 4,511,474, Cl. 210-512.100.

Kristinsson, Jon. Solar energy system. 4,510,992, Cl. 165-45.000.

Krol, Thijs; and Vonk, Bernardus J., to U.S. Philips Corporation. Data processing device for processing multiple-symbol data-words based on a symbol-correcting code and having multiple operating modes. 4,512,020, Cl. 371-37.000.

Kroupa, Loretta A.; and Agbomeirele, Patricia G., to Dow Corning Corporation. Method for prevention of bubble formation in polyorganosiloxane gels. 4,511,620, Cl. 428-220.000.

Krude, Werner, to Uni-Cardan Aktiengesellschaft. Cardan joint. 4,511,344, Cl. 464-139.000.

Krueger, David A.: *See*—
Conley, Richard W.; Tremblay, Richard P.; Bolam, Charles W.; Logan, James E.; and Krueger, David A., 4,511,120, Cl. 251-288.000.

Kruger, Bernd-Wieland; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. (Thio)(dithio-phosphates(phosphonates), processes for their preparation, and their use in pest-combating agents. 4,511,562, Cl. 514-112.000.

Kruger, Horst: *See*—
Kuhl, Uwe; Krause, Andreas; and Kruger, Horst, 4,511,118, Cl. 251-137.000.

Krupp-Koppers GmbH: *See*—
Diemer, Peter; Brake, Werner; and Dittmer, Rainer, 4,511,549, Cl. 423-574.00R.

Kruyer, Jan. Process for recovering minerals and metals by oleophilic adhesion. 4,511,461, Cl. 209-47.000.

Kubo, Junji: *See*—
Ishizuka, Seiichi; and Kubo, Junji, 4,511,564, Cl. 514-167.000.

Kubota Ltd.: *See*—
Konoki, Keizo; Shinohara, Takanobu; Kochi, Ikuyoshi; Shibata, Keiichi; Nishihara, Hisakatsu; Morichika, Toshiaki; Sugitani, Junichi; and Tsuchida, Koji, 4,510,988, Cl. 164-102.000.
Yano, Naomichi; Makido, Isao; and Ito, Hajime, 4,510,921, Cl. 126-429.000.

Kubota, Yuichi: *See*—
Konno, Ryozo; Sugai, Makio; Kubota, Yuichi; Nishimatsu, Masaharu; Isobe, Yukihiro; Tanaka, Kazushi; and Shinoura, Osamu, 4,511,629, Cl. 428-522.000.

Kudert, Frederick G.; Latreille, Maurice G.; and Tennant, William A., to American Can Company. Flow stream channel splitter devices for multi-coinjection nozzle injection molding machines. 4,511,528, Cl. 264-328.800.

Kudo, Shiro; and Hayashi, Mitsuyoshi, to Asahi-Matsu Foods Inc.; and Mitsubishi Corporation. Preservable granular tofu (soybean curd) and the process of production thereof. 4,511,588, Cl. 426-302.000.

Kudoh, Michio; Matsuno, Mitsuo; and Imai, Hirosuke, to Nippon Oil Co., Ltd. Process for producing alkylbenzenes. 4,511,748, Cl. 585-467.000.

Kuehn, Volker; Rothfuss, Werner; and Widmaier, Richard, to International Standard Electric Corporation. Component-insertion table for manually equipping circuit carriers. 4,511,421, Cl. 156-356.000.

Kuge, Toshio: *See*—
Nakamura, Yoichi; Yamamoto, Akio; Nogita, Shunsuke; Kuge, Toshio; and Muroi, Katsumi, 4,511,363, Cl. 44-1.00G.

Kugler, Tibor, to Swiss Aluminium Ltd. Process for purifying aluminum with sodium. 4,511,398, Cl. 75-63.000.

Kuhl, Uwe; Krause, Andreas; and Kruger, Horst, to Dragerwerk Aktiengesellschaft. Electromagnetic ball valve. 4,511,118, Cl. 251-137.000.

Kuhlmann, Heinz; and Prinz, Eckhard, to Erwin Kampf GmbH & Co., Firma; and Softal GmbH, Firma. Method and device for laminating foils. 4,511,419, Cl. 156-272.600.

Kuhnel, Werner; Putz, Peter; Simm, Manfred; and Spielau, Paul, to Dynamit Nobel AG. Sealing sheet of elastomeric synthetic resins with textile reinforcement on outer layer. 4,511,619, Cl. 428-215.000.

Kujawa, Joseph J.: *See*—
Barkhau, Marvin L.; and Kujawa, Joseph J., 4,511,385, Cl. 65-135.000.

Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D.; Nunn, Timothy A.; and Mallon, Joseph R., 4,510,671, Cl. 29-571.000.

Kulprathipanja, Santi: *See*—
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., 4,511,514, Cl. 260-419.000.

Kumagai, Katuya: *See*—
Hideyama, Shozo; Ishizawa, Akio; Kumagai, Katuya; and Hashimoto, Minoru, 4,511,617, Cl. 428-412.000.

Kumakura, Mikio: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,511,574, Cl. 514-371.000.

Kumano, Shinji, to Nippon Gakki Seizo Kabushiki Kaisha. Keyboard structures of electronic musical instruments. 4,510,839, Cl. 84-434.000.

Kunii, Takeshi: *See*—
Nakayama, Yasunobu; Sato, Yasuji; and Kunii, Takeshi, 4,511,764, Cl. 179-90.0AN.

Kunz, Barbara L.: *See*—
Abbey, Kirk J.; and Kunz, Barbara L., 4,511,446, Cl. 204-181.00C.

Kunz, Gary L.: *See*—
Jones, Dennis J.; and Kunz, Gary L., 4,511,466, Cl. 209-395.000.

Kunze, Oswald, to Klockner-Humboldt-Deutz AG. Device for burning cement. 4,511,333, Cl. 432-106.000.

Kuo, Calven, to Aurora Mechatronics Corporation. Universal control device for restricting dialing and time limiting telephone calls. 4,511,765, Cl. 179-90.0BD.

Kuo, Chuan M. Cutting torch. 4,511,086, Cl. 239-416.300.

Kurakake, Mitsuo, to Fujitsu Fanuc Limited. Numerical control device. 4,511,982, Cl. 364-167.000.

Kuraray Company, Ltd.: *See*—
Ninagawa, Yoichi; Yamada, Osamu; Renge, Tsumoru; Kyo, Sunao; Osaki, Takayoshi; and Kushida, Koichi, 4,511,751, Cl. 585-608.000.

Kurematsu, Akira: *See*—
Konishi, Kazunori; and Kurematsu, Akira, 4,511,758, Cl. 178-2.00B.

Kuribayashi, Sadatomo. Rudder arrangement for ships. 4,510,880, Cl. 114-162.000.

Kuroda, Kouki: *See*—
Suzuki, Koji; Kuroda, Kouki; and Nagahira, Jyoji, 4,511,240, Cl. 355-14.00R.

Kurtz, Anthony D.; Nunn, Timothy A.; and Mallon, Joseph R., to Kulite Semiconductor Products, Inc. Dielectrically isolated transducer employing single crystal strain gages. 4,510,671, Cl. 29-571.000.

Kushida, Koichi: *See*—
Ninagawa, Yoichi; Yamada, Osamu; Renge, Tsumoru; Kyo, Sunao; Osaki, Takayoshi; and Kushida, Koichi, 4,511,751, Cl. 585-608.000.

Kuwakado, Satosi: *See*—
Taguchi, Masahiro; Kuwakado, Satosi; and Tsuge, Noboru, 4,510,749, Cl. 60-286.000.
Tsuge, Noboru; Taguchi, Masahiro; and Kuwakado, Satosi, 4,511,097, Cl. 242-55.000.

Kwon, Young J.; and Evans, Harmon A., to Westinghouse Electric Corp. Control method for large scale batch reduction of zirconium tetrachloride. 4,511,399, Cl. 75-84.500.

Kyo, Sunao: *See*—
Ninagawa, Yoichi; Yamada, Osamu; Renge, Tsumoru; Kyo, Sunao; Osaki, Takayoshi; and Kushida, Koichi, 4,511,751, Cl. 585-608.000.

Kyocera Corporation: *See*—
Nagato, Yoshio; and Soroi, Kazunori, 4,511,665, Cl. 501-96.000.

Kyoritsu Gokin Mfg. Co., Ltd.: *See*—
Matsumoto, Kozo, 4,511,087, Cl. 239-433.000.

Kyotani, Yoshinori: *See*—
Umezawa, Hamao; Oono, Masaji; Ishihama, Hiroshi; Kyotani, Yoshinori; and Takahashi, Yoshio, 4,511,509, Cl. 260-239.00A.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
Tomita, Fusao; Tamaoki, Tatsuya; Shirahata, Kunikatsu; Iida, Takao; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,511,560, Cl. 514-27.000.

L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques: *See*—
Adler, Arno, 4,511,026, Cl. 198-469.000.

LaBarge, Robert L.; Horansky, Frank J.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., to Aluminum Company of America. Container recycling apparatus having shock mounted manually rotatable carrier. 4,510,857, Cl. 100-53.000.

LaBarge, Robert L.; Pohlenz, Elmer E.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Scherf, Thomas W., to Aluminum Company of America. Latch-

ing mechanism for manually rotatable carrier in apparatus for processing recyclable containers. 4,510,860, Cl. 100-49.000.

Lachonius, Leif, to Aktiobolaget SKF. Conveyor comprising easily mountable girder sections. 4,511,031, Cl. 198-836.000.

Lacroix, Alain, to Societe Lyonnaise des Applications Catalytiques. Gas-supply system for catalytic gas burners. 4,511,326, Cl. 431-53.000.

Lakeshore Eqtaipment & Supply Co.: *See*—
Morgan, Paul M., 4,511,090, Cl. 239-666.000.

Lamarche nee Lechevin, Marie-Odile: *See*—
Cassonnet, Jean-Claude M.; and Lamarche nee Lechevin, Marie-Odile, 4,511,983, Cl. 364-200.000.

Lambach, Heinrich W.: *See*—
Hansen, Erik; and Lambach, Heinrich W., 4,510,733, Cl. 53-434.000.

Lambert, Jack L.; and Chiang, Yuan C., to Kansas State University Research Foundation. Colorimetric detector for formaldehyde vapor. 4,511,658, Cl. 436-130.000.

Lambertus, Friedrich, to Werner & Pfleiderer. Extruder with a cassette filter for molten plastic material. 4,511,320, Cl. 425-199.000.

Lampe, Siegfried; Lehmann, Heinz; and Dose, Peter, to E.C.H. Will (GmbH & Co.). Apparatus for gathering writing pads or the like. 4,511,300, Cl. 414-35.000.

Lane, Thomas A.: *See*—
Webb, David M.; and Lane, Thomas A., 4,511,994, Cl. 364-900.000.

Lange, Peter M.: *See*—
Krimm, Heinrich; Buysch, Hans-Josef; Lange, Peter M.; and Klipper, Reinhold, 4,511,722, Cl. 548-231.000.

Langenau Manufacturing Company, The: *See*—
Strangward, William J., 4,510,786, Cl. 72-326.000.

Lanham, Steven M.: *See*—
Beaty, Larry E.; and Lanham, Steven M., 4,511,651, Cl. 435-15.000.

Laor, Herzl. Piezoelectric apparatus for positioning optical fibers. 4,512,036, Cl. 455-612.000.

Laroche, Pierre: *See*—
Duchene, Eloi; and Laroche, Pierre, 4,511,618, Cl. 428-215.000.

Latreille, Maurice G.: *See*—
Kudert, Frederick G.; Latreille, Maurice G.; and Tennant, William A., 4,511,528, Cl. 264-328.800.

Laurel Bank Machine Co., Ltd.: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,511,133, Cl. 271-3.100.

Laurent, Henry; Nickisch, Klaus; Bittler, Dieter; Wiechert, Rudolf; and Losert, Wolfgang, to Schering Aktiengesellschaft. 7α-Acylthio-1α,-2α-methylene-3-oxo-17α-pregn-4-ene-21,17-carbolactones, their production and pharmaceutical preparations containing them. 4,511,565, Cl. 514-173.000.

Lautzenhiser, Lloyd L.: *See*—
Presley, Glen T.; and Lautzenhiser, Lloyd L., 4,510,963, Cl. 137-117.000.

Lawrence, Christopher J.; Wilkinson, Philip M.; and Atkinson, Colin, to Rieter-Scragg Limited. Apparatus for false twisting yarn. 4,510,744, Cl. 57-280.000.

Lay, Aranka: *See*—
Budai, Zoltan; Kis-Tamas, Attila; Mezei, Tibor; Lay, Aranka; Vigh, Zoltan; and Sokorai, Agnes, 4,511,737, Cl. 564-257.000.

Leach, Earl A., Jr., to Allied Corporation. Mounting assembly for a speed sensor. 4,511,840, Cl. 324-160.000.

Leary, Michael J.: *See*—
Reichgott, David W.; and Leary, Michael J., 4,511,676, Cl. 521-26.000.

Leas, James M., to Solarex Corporation. Solar cell metal spray process. 4,511,600, Cl. 427-75.000.

Lee, Carleton C.: *See*—
Nielsen, Steven T.; and Lee, Carleton C., 4,511,349, Cl. 494-16.000.

Lee, Donald L.: *See*—
Chai, Bruce H.; Bailey, Dana S.; Vetelino, John F.; Lee, Donald L.; and Andle, Jeffrey C., 4,511,817, Cl. 310-313.00A.

Lee, Fui-Tseng H.; Juelke, Charles V.; and Finley, Joseph H., to FMC Corporation. Mixed phenyl/mesityl phosphate ester composition. 4,511,498, Cl. 252-609.000.

Lee, Wha S.: *See*—
Yoo, Han S.; and Lee, Wha S., 4,511,709, Cl. 528-331.000.

Leech, Francis, to USM Corporation. Drive for shell type rolls. 4,510,823, Cl. 74-789.000.

Leftault, Charles J., Jr.: *See*—
LaBarge, Robert L.; Horansky, Frank J.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,510,857, Cl. 100-53.000.
LaBarge, Robert L.; Pohlenz, Elmer E.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Scherf, Thomas W., 4,510,860, Cl. 100-49.000.

Leger, Robert: *See*—
Denis, Jacques; Sillion, Bernard; Damin, Bernard; and Leger, Robert, 4,511,369, Cl. 44-62.000.

Lehky, Pavel; and Hardt, Peter, to Lonza Ltd. Process for the production of 3,3-dimethylglutaric. 4,511,734, Cl. 562-524.000.

Lehmann, Heinz: *See*—
Lampe, Siegfried; Lehmann, Heinz; and Dose, Peter, 4,511,300, Cl. 414-35.000.

Leiber, Heinz, to Robert Bosch GmbH. Speed control apparatus for vehicles. 4,510,905, Cl. 123-360.000.

Leigh Flexible Structure Ltd.: *See*—
Hardacre, Nicholas P., 4,511,286, Cl. 405-115.000.

Leiser, Volker: *See*—
Luther, Gunter; Loebel, Peter; Risse, Gerhard; and Leiser, Volker, 4,510,932, Cl. 128-204.290.

Leitz, Helmut, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Method of calibration for the measuring of objects by pairs of theodolites. 4,510,695, Cl. 33-293.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Newton, Steven A.; and Bowers, John E., 4,511,207, Cl. 350-96.150.

Leloup, Jean: *See*—
Barraud, Andre ; and Leloup, Jean, 4,511,604, Cl. 427-402.000.

Lem, Hans J., to Air Lane Systems Inc. Article accumulating conveyor system. 4,511,030, Cl. 198-633.000.

Lemelson, Jerome H. Scanning apparatus and method. 4,511,918, Cl. 358-107.000.

Lemelson, Jerome H. Electro-optical information recording and reproduction system. 4,511,930, Cl. 358-335.000.

Le Nabour, Marcel P.: *See*—
Boy-Marcotte, Jean-Louis; Dahan, Gilbert M. I.; Dancette, Michel; Le Nabour, Marcel P.; Pellerin, Jean-Francois G. A.; Rivallin, Jose ; and Jannot, Marcel A. J., 4,511,805, Cl. 290-2.000.

Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Produktionsaktienselskab): *See*—
von Daehne, Welf, 4,511,512, Cl. 260-245.20R.

Lever Brothers Company: *See*—
Melville, James B., 4,511,495, Cl. 252-522.00A.

Levine, James L.: *See*—
Garwin, Richard L.; and Levine, James L., 4,511,760, Cl. 178-18.000.

Levy, Leonard R.: *See*—
Orio, Alfred P.; Levy, Leonard R.; and Gulla, Michael, 4,511,403, Cl. 106-1.220.

Lewbart, Marvin L., to Crozer-Chester Medical Center. Prednisolone derivatives. 4,511,511, Cl. 260-239.55D.

Lewis, David H.: *See*—
Bartuska, Victor J.; Lewis, David H.; Lewis, Robin B.; and Dalbow, David G., 4,511,841, Cl. 324-321.000.

Lewis, Henry G., Jr., to RCA Corporation. Digital television system with truncation error correction. 4,511,922, Cl. 358-166.000.

Lewis, Robin B.: *See*—
Bartuska, Victor J.; Lewis, David H.; Lewis, Robin B.; and Dalbow, David G., 4,511,841, Cl. 324-321.000.

Liang, Gao: *See*—
Sapru, Krishna; Reichman, Benjamin; and Liang, Gao, 4,511,638, Cl. 429-111.000.

Licentia Patent-Verwaltungs GmbH: *See*—
Lindner, Kurt, 4,511,897, Cl. 343-6.00R.

Lieberman, Ephraim: *See*—
Bordoni, Maurice E.; and Lieberman, Ephraim, 4,510,929, Cl. 128-200.140.

Lienerth, Aladar: *See*—
Heck, Gunter; Lienerth, Aladar; Malow, Egon; Schwarz, Karl-Heinz; and Faust, Uwe, 4,511,437, Cl. 203-19.000.

Lietzke, Heinz: *See*—
Baumers, Johannes; Lisken, Werner; and Lietzke, Heinz, 4,510,815, Cl. 74-61.000.

Lik-Nu Porcelain, Inc.: *See*—
Thomas, Walter; and Lucatuorto, Peter, 4,511,621, Cl. 428-285.000.

Linatex Canada Inc.: *See*—
Jackson, Lawrence D. A., 4,511,116, Cl. 251-5.000.

Lincoln, Kay L.; and Ochoa, Ricardo, to Upjohn Company, The. Animal fecal collection system. 4,510,887, Cl. 119-95.000.

Linden, Harry A., to American Sterilizer Company. Apparatus for changing the direction of rotation of a rotating shaft. 4,510,816, Cl. 74-372.000.

Lindner, Christian; Braese, Hans-Eberhard; Ott, Karl-Heinz; and Uerdingen, Walter, to Bayer Aktiengesellschaft. Soft polymer alloys. 4,511,695, Cl. 525-80.000.

Lindner, Kurt, to Licentia Patent-Verwaltungs GmbH. Sensor system for metallic targets including doppler radar and radiometer. 4,511,897, Cl. 343-6.00R.

Lindsey, James C., to Cavalier Corporation. Antitheft side mounted escrows for vending machine. 4,511,060, Cl. 221-115.000.

Lingenfelter, Lowell R.: *See*—
Schuler, John G.; and Lingenfelter, Lowell R., 4,511,196, Cl. 339-14.00R.

Link, Donald A.; Swessel, John A., Jr.; and Theisen, Peter J., to Eaton Corporation. Arc extinguishing structure for electrical switching device. 4,511,772, Cl. 200-144.00R.

Linner, Hans, to Norden Packaging Machinery AB. Hot gas sealing device. 4,511,426, Cl. 156-497.000.

Lion Industries Ltd.: *See*—
Yuill, Grenville K., 4,510,791, Cl. 73-40.000.

Lipson, Herbert G. Variable neutral density laser goggles. 4,511,225, Cl. 351-49.000.

Lisken, Werner: *See*—
Baumers, Johannes; Lisken, Werner; and Lietzke, Heinz, 4,510,815, Cl. 74-61.000.

Litkei, Gyorgy: *See*—
Mogyorodi, Ferenc; Koppany, Eniko; Bodi, Tibor; Balogh, Karoly; Toth, Istvan; Bognar, Rezso; Makleit, Sandor; Litkei, Gyorgy; Rakosi, Miklos; and Dinya, Zoltan, 4,511,736, Cl. 564-214.000.

Liu, Shuchen, to American Hoechst Corporation. Aqueous developable diazo lithographic printing plates with admixture of polyvinyl acetate and styrene maleic acid ester copolymer. 4,511,640, Cl. 430-157.000.

Livigni, Russell A.: *See*—
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., 4,511,699, Cl. 525-205.000.
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., 4,511,700, Cl. 525-283.000.
Lobsinger, James L.: *See*—
Aleem, Mohd A.; Lobsinger, James L.; and Wefel, Jerry D., 4,510,679, Cl. 29-598.000.
Locatelli, Claudio; and Dragagna, Claudio, to F. LLI Marzoli & C. S.P.A. Device for control of conductive materials in bale-breaker machines. 4,510,646, Cl. 19-80.00R.
Lock, Pieter J., to Rubber-en Kunststoffabriek ENBI B.V. Method of producing a packing ring. 4,510,664, Cl. 29-450.000.
Loebel, Peter: *See*—
Luther, Gunter; Loebel, Peter; Risse, Gerhard; and Leiser, Volker, 4,510,932, Cl. 128-204.290.
Loepfe Brothers Limited: *See*—
Stutz, Hansruedi, 4,512,028, Cl. 377-16.000.
Loewenstern, Kenneth M.: *See*—
Maltby, Frederick L.; Loewenstern, Kenneth M.; and Benning, Jack G., Jr., 4,511,948, Cl. 361-280.000.
Logan, James E.: *See*—
Conley, Richard W.; Tremblay, Richard P.; Bolam, Charles W.; Logan, James E.; and Krueger, David A., 4,511,120, Cl. 251-288.000.
Logsdon, Bill C.: *See*—
Hanna, Thomas J.; Logsdon, Bill C.; and Meredith, Elmer E., 4,510,710, Cl. 43-42.130.
Lone Star Steel Company: *See*—
Roberts, Charles D.; and Cave, Ben R., 4,511,124, Cl. 266-44.000.
Long, Dennis L. Modular unit with foldable panels. 4,511,024, Cl. 198-346.000.
Long, Robert A.: *See*—
Goodrich, Lloyd E., Jr.; and Long, Robert A., 4,511,153, Cl. 279-2.00R.
Long, Stanley A.: *See*—
Akse, James R.; and Long, Stanley A., 4,511,601, Cl. 427-79.000.
Lonza Ltd.: *See*—
Lehky, Pavel; and Hardt, Peter, 4,511,734, Cl. 562-524.000.
Lopez, Louis, to Container Corporation of America. Variable dimension container. 4,511,079, Cl. 229-34.00R.
L'Oreal: *See*—
Monnais, Christian; Cotteret, Jean; and Bugaut, Andree , 4,511,360, Cl. 8-405.000.
Lorince, Julius, to Modern Machine and Grinding, Inc. Side trimmer knife. 4,510,689, Cl. 30-347.000.
Losenhausen Maschinenbau AG: *See*—
Baumers, Johannes; Lisken, Werner; and Lietzke, Heinz, 4,510,815, Cl. 74-61.000.
Losert, Wolfgang: *See*—
Laurent, Henry; Nickisch, Klaus; Bittler, Dieter; Wiechert, Rudolf; and Losert, Wolfgang, 4,511,565, Cl. 514-173.000.
Lothman, Stig A., to Tetra Pak International AB. Machine for the processing of packing containers. 4,510,732, Cl. 53-168.000.
Loube, Irving: *See*—
Eichenlaub, Carl, 4,510,718, Cl. 51-170.0EB.
Lovgren, Eric M.: *See*—
Schmidt, Lawrence R.; and Lovgren, Eric M., 4,511,535, Cl. 422-137.000.
Lubbers, Dietrich W.; and Opitz, Norbert. Process and arrangement for measuring ion strength. 4,511,660, Cl. 436-163.000.
Lubojatzki, Walter, to Klockner-Becorit GmbH. Support frame for underground mining operations. 4,511,290, Cl. 405-292.000.
Lucas, David J.: *See*—
Vella, Paul L., 4,510,770, Cl. 62-464.000.
Lucas Industries: *See*—
Thomas, Alan; and Glaze, Stanley G., 4,511,022, Cl. 188-299.000.
Lucas Industries Limited: *See*—
Williams, Francis V., 4,511,020, Cl. 188-73.390.
Lucas Industries Public Limited Company: *See*—
Wloczyk, Uwe, 4,511,185, Cl. 303-6.00C.
Lucatuorto, Peter: *See*—
Thomas, Walter; and Lucatuorto, Peter, 4,511,621, Cl. 428-285.000.
Lucous, Robert W. Box for wrapping and transporting flexible cordlike structure. 4,511,037, Cl. 206-396.000.
Luduena, Richard F., to Board of Regents, The University of Texas System. Bis-amide disulfide cleavable cross-linking reagents. 4,511,501, Cl. 260-112.00R.
Ludwigsen, John S., to Chicago Bridge & Iron Company. Passive structure with energy absorbing capacity. 4,511,115, Cl. 248-562.000.
Lueddecke, Erik: *See*—
Nissen, Axel; Horner, Michael; Horn, Dieter; Lueddecke, Erik; and Teege, Gernot, 4,511,685, Cl. 524-110.000.
Luetzelschwab, Wayne E., to Marathon Oil Company. Flow control apparatus and method. 4,510,993, Cl. 166-75.00R.
Lummus Company, The: *See*—
Suciu, George D.; Stefani, Giancarlo; and Fumagalli, Carlo, 4,511,670, Cl. 502-209.000.
Lundberg, Robert D.: *See*—
Fuller, Everett J.; and Lundberg, Robert D., 4,511,479, Cl. 210-708.000.
Peiffer, Dennis G.; Lundberg, Robert D.; and Walker, Thad O., 4,510,998, Cl. 166-295.000.
Luscher, Fred. Multifunction reprographic apparatus. 4,511,245, Cl. 355-43.000.
Luther, Gunter; Loebel, Peter; Risse, Gerhard; and Leiser, Volker, to GKSS-Forschungszentrum-Geesthacht GmbH. Apparatus for supplying divers with artificial respiratory gas mixtures. 4,510,932, Cl. 128-204.290.
Lypka, Alexander. Flax straw buncher. 4,510,742, Cl. 56-384.000.
M.A.N. Maschinenfabrik Aktiengesellschaft: *See*—
Oetringhaus, Walter G., 4,511,100, Cl. 242-86.510.
M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Cornils, Boy; Weber, Jurgen; Tihanyi, Bela; and DeWin, Werner, 4,511,439, Cl. 204-37.100.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Fischer, Hermann, 4,510,868, Cl. 101-415.100.
Mabley, Paul B.: *See*—
Burrows, Aubrey L.; Mabley, Paul B.; and Field, Steven J., 4,511,366, Cl. 44-53.000.
Macaster Controls, Inc.: *See*—
Boyce, William A., 4,510,694, Cl. 33-203.180.
MacDonald, Milton H., Jr. Insulated building structure and method for assembling same. 4,510,726, Cl. 52-309.800.
MacDonald, Robert C., to Westinghouse Electric Corp. Elevator system. 4,511,017, Cl. 187-29.00R.
Mace, Robert: *See*—
Ferton, Daniel; and Mace, Robert, 4,511,409, Cl. 148-2.000.
MacGregor, Fran W.: *See*—
Godfrey, Steven W.; Stern, Allen M.; and MacGregor, Fran W., 4,511,111, Cl. 248-459.000.
Machida, Tetsuo; Tsuhara, Susumu; Tabata, Kuniaki; and Okada, Yasuyuki, to Hitachi, Ltd. Memory control unit. 4,511,962, Cl. 364-200.000.
Mack, Heinz. Dental articulator. 4,511,332, Cl. 433-59.000.
Mack, James F. Seal for rotary actuator. 4,510,850, Cl. 92-125.000.
Mackenroth, Joseph R., III. High intensity ultraviolet light video imaging apparatus. 4,511,925, Cl. 358-244.000.
MacKenzie, Alfred K.: *See*—
Boyd, Mary G.; Smith, Donald R.; Imondi, Peter F.; Hiatt, Norman A.; Bauer, Fritz E.; Anemaet, John M.; and MacKenzie, Alfred K., 4,511,425, Cl. 156-493.000.
MacKenzie, Keith W., to Netcom, Inc. Biased holder for a crystal wafer. 4,511,820, Cl. 310-353.000.
Mackiol, Norbert: *See*—
Habeck, Reinhold; Mackiol, Norbert; Mautner, Franz; and Schwarzler, Peter, 4,510,871, Cl. 105-167.000.
Macy, Lawrence E., to Muncie Power Product Inc. Electronic overspeed switch. 4,510,899, Cl. 123-198.00D.
Madaus, Rolf; and Gorler, Klaus, to Dr. Madaus & Co. Laxative composition comprising psyllium seeds and senna fruits. 4,511,561, Cl. 424-195.100.
Maddox, James P., to Transamerica Delaval Inc. Vibration damped asymmetric rotor carrying liquid ring or rings. 4,511,309, Cl. 415-202.000.
Madgett, Raymond J.: *See*—
Kolodesh, Michael S.; Peters, Edward L.; and Madgett, Raymond J., 4,511,318, Cl. 425-133.100.
Madsen, Roger E.; and Williams, Michael M., to Packaging Corporation of America. Interlocking end closure flaps on collapsible eight-sided receptacle. 4,511,080, Cl. 229-41.00C.
Maeda, Chiaki: *See*—
Hisamoto, Iwao; Maeda, Chiaki; and Hirai, Masaru, 4,511,733, Cl. 560-253.000.
Maeda, Kazuo: *See*—
Yamazaki, Kenji; and Maeda, Kazuo, 4,511,761, Cl. 179-2.0EA.
Maeda, Kiyoto: *See*—
Ohsumi, Tadashi; Inoue, Satoru; and Maeda, Kiyoto, 4,511,581, Cl. 514-617.000.
Maeda, Masatoshi; Katsurai, Junji; and Ikeda, Hiroaki, to Konishiroku Photo Industry Co. Ltd. Picture image information recording apparatus. 4,511,929, Cl. 358-296.000.
Maeda, Narimichi: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,511,990, Cl. 364-748.000.
Maeda, Tetsuo: *See*—
Yamada, Jiro; Maeda, Tetsuo; and Yasuda, Hiroshi, 4,512,010, Cl. 369-220.000.
Magarian, Gerald M.; and Friedrich, Ralph S., to Ameron, Inc. Apparatus for winding fiber reinforced pipe fittings. 4,511,423, Cl. 156-425.000.
Magee, Philip S., to Chevron Research Company. Particulate fungicides. 4,511,735, Cl. 514-601.000.
Magid, David J.: *See*—
Banks, Russell; and Magid, David J., 4,510,734, Cl. 53-449.000.
MagneTek, Inc.: *See*—
Moore, Benson R.; and Gnacinski, Leonard T., 4,511,347, Cl. 474-43.000.
Magnuson, Karl. Building structure. 4,510,724, Cl. 52-233.000.
Magyar, Karoly: *See*—
Benko, Pal; Ratz nee Simonek, Ildiko ; Pallos, Laszlo ; Magyar, Karoly; Kovacs, Jeno ; Matrai, Erzsebet; Gundel, Janos; and Balogh, Albert, 4,511,717, Cl. 544-353.000.
Mahnke, Harald; Woerner, Frank P.; Weber, Heinz; and Kreibiehl, Guenter, to BASF Aktiengesellschaft. Resilient foam based on a melamine-formaldehyde condensate. 4,511,678, Cl. 521-52.000.
Mahrla, Peter, to Siemens Aktiengesellschaft. Semiconductor element. 4,511,912, Cl. 357-36.000.
Makido, Isao: *See*—
Yano, Naomichi; Makido, Isao; and Ito, Hajime, 4,510,921, Cl. 126-429.000.

Makino, Daisuke; Sato, Hidetaka; Suzuki, Hiroshi; Uchimura, Shunichiro; and Suzuki, Hiroshi, to Hitachi Chemical Company, Ltd.; and Hitachi, Ltd. Composition for protective coating material. 4,511,705, Cl. 528-26.000.

Makita, Fujio, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a power transmission of a four-wheel drive vehicle. 4,511,014, Cl. 180-233.000.

Makleit, Sandor: *See*—
Mogyorodi, Ferenc; Koppany, Eniko; Bodi, Tibor; Balogh, Karoly; Toth, Istvan; Bognar, Rezso; Makleit, Sandor; Litkei, Gyorgy; Rakosi, Miklos; and Dinya, Zoltan, 4,511,736, Cl. 564-214.000.

Maliarik, Mary J.: *See*—
Rohrbach, Ronald P.; Maliarik, Mary J.; and Malloy, Thomas P., 4,511,654, Cl. 435-95.000.

Mallon, Joseph R.: *See*—
Kurtz, Anthony D.; Nunn, Timothy A.; and Mallon, Joseph R., 4,510,671, Cl. 29-571.000.

Malloy, Thomas P.: *See*—
Rohrbach, Ronald P.; Maliarik, Mary J.; and Malloy, Thomas P., 4,511,654, Cl. 435-95.000.

Malow, Egon: *See*—
Heck, Gunter; Lienerth, Aladar; Malow, Egon; Schwarz, Karl-Heinz; and Faust, Uwe, 4,511,437, Cl. 203-19.000.

Maltby, Frederick L.; Loewenstern, Kenneth M.; and Benning, Jack G., Jr., to Drexelbrook Controls, Inc. Two layer probe. 4,511,948, Cl. 361-280.000.

Manaka, Toshio: *See*—
Atago, Takeshi; and Manaka, Toshio, 4,510,907, Cl. 123-435.000.

Mandigo, Frank N.: *See*—
Shapiro, Eugene; and Mandigo, Frank N., 4,511,410, Cl. 148-13.200.

Mannesman Rexroth GmbH: *See*—
Mucheyer, Norbert; and Kauss, Wolfgang, 4,510,847, Cl. 91-461.000.

Mannion, Geoffrey; and Palmer, Patrick V., to International Meehanite Metal Company Limited, The. Process for the treatment of molten metal. 4,511,401, Cl. 75-130.00R.

Manresa, Inc.: *See*—
Vaillancourt, Vincent L., 4,511,359, Cl. 604-411.000.

Mansei Kogyo Kabushiki Kaisha: *See*—
Tanaka, Yoshiharu, 4,511,212, Cl. 350-255.000.

Manufacture de Machines du Haut-Rhin, "Manurhin": *See*—
Nicolas, Jacques; and Raso, Roland, 4,510,869, Cl. 102-240.000.

Manville Service Corporation: *See*—
Ramge, Dennis L.; and Miller, John H., 4,511,328, Cl. 432-59.000.

Manzer, Marvin R., to Cavalier Corporation. Vending machine with side mounted escrows. 4,511,059, Cl. 221-115.000.

Mao, Raymond L. V.; and Bird, Peter H. Composite zeolite-asbestos catalysts. 4,511,667, Cl. 502-64.000.

Marathon Oil Company: *See*—
Luetzelschwab, Wayne E., 4,510,993, Cl. 166-75.00R.

Marconi Co. Ltd., The: *See*—
Byatt, Dennis W. G.; and Walker, John W., 4,510,804, Cl. 73-290.00V.

Marcus, Konrad H.; and Cody, Michael J., to Prince Corporation. Visor with auxiliary light. 4,511,954, Cl. 362-275.000.

Margerum, Edward S.; and Hiatt, Norman A., to Dennison Mfg. Company. Thermal imprinting of substrates. 4,511,602, Cl. 427-148.000.

Marianu, Vlad, to ITT Industries, Inc. Spot-type disc brake, in particular for automotive vehicles. 4,511,019, Cl. 188-72.200.

Marine Construction & Design Co.: *See*—
Svendsen, Robert A., 4,511,122, Cl. 254-332.000.

Mark, Seymour, to Sohio Alternate Energy Development Company. Coal-aqueous mixtures. 4,511,365, Cl. 44-51'.000.

Markert, Juergen: *See*—
Hagen, Helmut; Markert, Juergen; Kohler, Rolf-Dieter; and Wuerzer, Bruno, 4,511,393, Cl. 71-92.000.

Marko, Adolf R.: *See*—
von Gierke, Henning E.; and Marko, Adolf R., 4,511,228, Cl. 351-243.000.

Markowitz, Jerome, to Allen Organ Company. Touch sensitivity in an electronic musical instrument having non-positive attack. 4,510,836, Cl. 84-1.260.

Marks, Milton, to Guardian Fasteners and Closure Systems. Extension for a screwgun. 4,510,826, Cl. 81-57.370.

Marsh, James C., Jr.: *See*—
Harlan, Wayne E.; and Marsh, James C., Jr., 4,511,921, Cl. 358-161.000.

Marshall, Eric J. High speed printer. 4,511,268, Cl. 400-119.000.

Martens, Jurgen: *See*—
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,511,719, Cl. 546-245.000.

Martin, Don M.: *See*—
Martin, Ernest N.; Barner, William H.; and Martin, Don M., 4,511,067, Cl. 222-230.000.

Martin, Ernest N.; Barner, William H.; and Martin, Don M. Particulate material dispensing device. 4,511,067, Cl. 222-230.000.

Martin, Eugene R., to SWS Silicones Corporation. Quaternary ammonium-functional silicon compounds. 4,511,727, Cl. 556-418.000.

Martin, Jean-Claude: *See*—
Sella, Claude; Tran-Khanh, Vien; and Martin, Jean-Claude, 4,511,451, Cl. 204-298.000.

Martin, Pierre: *See*—
Boger, Manfred; Ehrenfreund, Josef; Martin, Pierre; and Steiner, Eginhard, 4,511,571, Cl. 514-351.000.

Martin, Ronald J.: *See*—
Ashbee, William H.; Janssen, Donovan M.; Martin, Ronald J.; and Seaward, William S., 4,511,242, Cl. 355-14.00C.

Mason, Richard: *See*—
Miller, Anne K. M.; and Mason, Richard, 4,511,038, Cl. 206-454.000.

Masuda, Eiji: *See*—
Matsuo, Kenji; and Masuda, Eiji, 4,511,814, Cl. 307-572.000.

Masuko, Akinori, to Tokyo Shibaura Denki Kabushiki Kaisha. Object detector which compares returned signals from successive transmissions. 4,512,000, Cl. 367-93.000.

Masuyama, Masayuki: *See*—
Nunokawa, Kazuo; and Masuyama, Masayuki, 4,511,227, Cl. 351-208.000.

Mathad, Gangadhara S.: *See*—
Chen, Lee; and Mathad, Gangadhara S., 4,511,430, Cl. 156-643.000.

Mathieu, Raymond J., to Hobart Corporation. Film wrapping machine including film length selection. 4,510,731, Cl. 53-66.000.

Matoba, Yasuo; and Ishimori, Isao, to Osaka Soda Co. Ltd. Curable composition of epichlorohydrin rubber and acrylic rubber and cured composition therefrom. 4,511,698, Cl. 525-187.000.

Matrai, Erzsebet: *See*—
Benko, Pal; Ratz nee Simonck, Ildiko ; Pallos, Laszlo ; Magyar, Karoly; Kovacs, Jeno ; Matrai, Erzsebet; Gundel, Janos; and Balogh, Albert, 4,511,717, Cl. 544-353.000.

Matson, Wayne R., to ESA, Inc. Liquid chromatograph with electrochemical detector and method. 4,511,659, Cl. 436-150.000.

Matsubara, Naoki; and Numata, Hideo, to Oval Engineering Co., Ltd. Electrode connections for a piezoelectric sensor. 4,511,819, Cl. 310-340.000.

Matsuda, Satoshi: *See*—
Nakamura, Takeshi; Nishiyama, Hiroshi; Matsuda, Satoshi; and Matsumoto, Ikuo, 4,511,821, Cl. 310-354.000.

Matsuda, Toshiharu; Imamura, Minoru; and Saho, Norihide, to Hitachi, Ltd. Cryostat with refrigerating machine. 4,510,771, Cl. 62-514.00R.

Matsuda, Yoshio: *See*—
Yoshida, Hiroshi; Matsuda, Yoshio; and Komeya, Akira, 4,510,656, Cl. 24-390.000.

Matsui, Fumio; Aono, Shin; Sakai, Hiroshi; Hattori, Katsuhide; and Kakino, Shigeru, to Nippon Oil and Fats Co. Ltd. Method of producing a water-in-oil emulsion explosive. 4,511,414, Cl. 149-109.600.

Matsumoto, Dairiku: *See*—
Kawai, Seiji; and Matsumoto, Dairiku, 4,511,305, Cl. 414-755.000.

Matsumoto, Ikuo: *See*—
Nakamura, Takeshi; Nishiyama, Hiroshi; Matsuda, Satoshi; and Matsumoto, Ikuo, 4,511,821, Cl. 310-354.000.

Matsumoto, Kozo, to Kyoritsu Gokin Mfg. Co., Ltd. Air mist nozzle apparatus. 4,511,087, Cl. 239-433.000.

Matsumoto, Masao; and Imai, Shigeru, to Yoshida Kogyo K. K. Apparatus and a method for forming space sections in a slide fastener chain having coupling elements in the form of continuous coil. 4,510,662, Cl. 29-408.000.

Matsumura, Ikuei: *See*—
Natori, Takeshi; Kobayashi, Yoji; Watanabe, Shigetaka; Shimizu, Katsumi; Matsumura, Ikuei; Namekawa, Yoshihiro; and Miyanaga, Satoshi, 4,510,974, Cl. 138-137.000.

Matsumura, Susumu; and Imataki, Mitsumasa, to Matsumura, Susumu; and Susumu Matsumura and Mitsubishi Denki Kabushiki Kaisha. Power converter. 4,511,957, Cl. 363-54.000.

Matsuno, Mitsuo: *See*—
Kudoh, Michio; Matsuno, Mitsuo; and Imai, Hirosuke, 4,511,748, Cl. 585-467.000.

Matsuo, Kenji; and Masuda, Eiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor analog switch circuit with compensation means to minimize offset of output voltage. 4,511,814, Cl. 307-572.000.

Matsuo, Kenzaburo: *See*—
Ida, Jinsei; Fujita, Tsutomu; Yamada, Ichiho; Higuchi, Fumio; and Matsuo, Kenzaburo, 4,510,669, Cl. 29-568.000.

Matsuo, Yasushi: *See*—
Miura, Kazunori; Hattori, Yoshinori; and Matsuo, Yasushi, 4,511,402, Cl. 75-233.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Ogino, Toshiro; and Kokawa, Katsuzo, 4,511,327, Cl. 431-201.000.
Shinohara, Isao, 4,511,939, Cl. 360-93.000.
Yamada, Jiro; Maeda, Tetsuo; and Yasuda, Hiroshi, 4,512,010, Cl. 369-220.000.

Matta, Grant B., to Penetone Corporation. D-Limonene based aqueous cleaning compositions. 4,511,488, Cl. 252-162.000.

Mattel, Inc.: *See*—
Hart, William; and McKittrick, Michael T., Jr., 4,511,342, Cl. 446-429.000.

Matthies, Karl H.; and Harlos, Hartmut, to U.S. Philips Corporation. Differential amplifier circuit having improved control signal filtering. 4,511,853, Cl. 330-259.000.

Matumoto, Yuuichi, to Soda Aromatic Company, Limited. Slow-release perfume compositions and a process for the preparation of them. 4,511,496, Cl. 252-522.00A.

Maurel, Pierre: *See*—
Crussard, Charles; Maurel, Pierre; and Bonhomme, Jean, 4,511,540, Cl. 423-26.000.

Maurer, Alexander: *See*—
Schrodter, Klaus; and Maurer, Alexander, 4,511,546, Cl. 423-305.000.

Mauri, Francesco, to Ravizza S.p.A. Process for preparing a 7-chloro-5-(2-chlorophenyl)-benzodiazepinone. 4,511,510, Cl. 260-239.30D.

Mautner, Franz: *See*—
Habeck, Reinhold; Mackiol, Norbert; Mautner, Franz; and Schwarzler, Peter, 4,510,871, Cl. 105-167.000.
Maxwell Laboratories, Inc.: *See*—
Kent, Henry R., 4,511,094, Cl. 242-7.080.
May, Michael G., to AIR Ltd. Pressure drop power generation. 4,511,806, Cl. 290-43.000.
May, Ronald J., to American Audiographics, Inc. Promotional attachment for beverage packages. 4,511,033, Cl. 206-216.000.
Mayer, Frederic C. Production of metal rods. 4,510,989, Cl. 164-415.000.
Mayer, Rothkopf Industries, Inc.: *See*—
Quay, Earl R.; and Tilson, Alan L., 4,510,773, Cl. 66-9.00B.
Mayer, Walter P.; and Burns, Richard J., to Union Carbide Corporation. Water-dispersible coating compositions and process. 4,511,682, Cl. 523-402.000.
Mayernik, Richard: *See*—
Teng, Yu-Ling; and Mayernik, Richard, 4,511,597, Cl. 427-53.100.
Mayne, W. Harry; and Zilkha, Sasson, to Geosource Inc. Method and apparatus for seismic exploration using nonlinear sweeps. 4,512,001, Cl. 367-189.000.
Maytag Company, The: *See*—
Cotton, Curran D., 4,510,778, Cl. 68-12.00R.
Ellingson, David I.; and Wilson, James D., 4,510,777, Cl. 68-12.00R.
McNally, William J.; and Mellinger, John C., 4,510,776, Cl. 68-3.00R.
Mazda Motor Corporation: *See*—
Inoue, Hitoshi, 4,511,160, Cl. 280-701.000.
Tsuchida, Tsuyoshi; and Kido, Yoshinobu, 4,510,902, Cl. 123-325.000.
McCabe, Graham, to Ford Motor Company. Ball joints and liners therefor. 4,511,277, Cl. 403-140.000.
McCartney, John R., to Norwood Industries, Inc. Process for producing polishing pads comprising a fully impregnated non-woven batt. 4,511,605, Cl. 427-246.000.
McClellan, Robert D., Jr. Thermally insulating device for a beverage-containing bottle. 4,510,769, Cl. 62-457.000.
McCombs, Norman R., to Greene & Kellogg, Inc. Apparatus for the production of oxygen. 4,511,377, Cl. 55-163.000.
McCullagh, Keith G.; Wadsworth, Harry J.; and Hann, Michael M., to G.D. Searle & Co. Carboxyalkyl peptide derivatives. 4,511,504, Cl. 260-112.50R.
McCurry, Lynn E.: *See*—
Saprokhin, Alexander M.; Friedland, David J.; Baran, Richard M.; Kim, Jung T.; and McCurry, Lynn E., 4,511,440, Cl. 204-60.000.
McGahan, Wallace A., to Schlage Lock Company. Programmable combination electronic lock. 4,511,946, Cl. 361-172.000.
McGibbon, Gregor D.: *See*—
Skidanenko, Constatine V.; and McGibbon, Gregor D., 4,511,763, Cl. 179-16.0AA.
McGlove, William R.: *See*—
Amos, Homer C.; Benedyk, Joseph C.; Scheie, Carl E.; and McGlove, William R., 4,511,148, Cl. 273-326.000.
McGovern, Paul A.; and Zambuto, Mauro. Surveying technique with correction of optical errors caused by atmospheric turbulence. 4,511,247, Cl. 356-3.000.
McGraw-Edison Company: *See*—
Rasmussen, John F.; and Gaia, Aldino J., 4,511,874, Cl. 337-159.000.
Urani, Angelo, 4,511,876, Cl. 337-244.000.
McInnis, Stirling A. Speed control of a D.C. electric motor. 4,511,831, Cl. 318-351.000.
McIntyre, James A.; and Phillips, Robert F., to Dow Chemical Company, The. Method of operating a liquid-gas electrochemical cell. 4,511,441, Cl. 204-98.000.
McIntyre, John N.: *See*—
Jennings, Charles E.; Barrington, Claud C.; Chen, Lien-Yan; Hopkins, Bob C.; McIntyre, John N.; and Regitz, Alfred P., 4,510,960, Cl. 137-75.000.
McKee, Robert N.: *See*—
Bartlett, Robert L.; and McKee, Robert N., 4,510,980, Cl. 144-1.00C.
McKinley, Mark J.; and Sanner, Jim W., to Dow Chemical Company, The. Process of using water-absorbent agents for low pH applications. 4,511,477, Cl. 210-689.000.
McKittrick, Michael T., Jr.: *See*—
Hart, William; and McKittrick, Michael T., Jr., 4,511,342, Cl. 446-429.000.
McNally, William J.; and Mellinger, John C., to Maytag Company, The. Sliding access door for washing machine. 4,510,776, Cl. 68-3.00R.
McNelis, Robert L.: *See*—
Volakakis, John G.; McNelis, Robert L.; and Wallentin, Burt H., 4,511,048, Cl. 212-253.000.
MDS-Qantel, Inc.: *See*—
Fencsik, Gabor; and Glenn, Fletcher M., II, 4,511,968, Cl. 364-200.000.
Mead Johnson & Company: *See*—
Harris, Nancy T.; and Harris, Leonard C., 4,511,163, Cl. 285-177.000.
Media Research s.r.l.: *See*—
Bruno, Graziella, 4,511,577, Cl. 514-448.000.
Medical Magnetics, Inc.: *See*—
Smiley, Harry; and Blechman, Abraham, 4,511,330, Cl. 433-18.000.
Medical Research Associates, Ltd.: *See*—
Sterling, Robert E., 4,511,354, Cl. 604-98.000.
Meggle Milchindustrie GmbH & Co. KG: *See*—
Boesig, Werner; and Pritzwald-Stegmann, Bernd, 4,511,553, Cl. 424-35.000.
Mehra, Yuv R., to El Paso Hydrocarbons Company. Process for extracting natural gas liquids from natural gas streams with physical solvents. 4,511,381, Cl. 62-17.000.
Meidensha Electric Mfg. Co., Ltd.: *See*—
Kawai, Seiji; and Matsumoto, Dairiku, 4,511,305, Cl. 414-755.000.
Meister, Richard P., to Bunting Magnetics Company. Gang conveyor drive mount and method for transporting. 4,511,028, Cl. 198-497.000.
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., to General Tire & Rubber Company, The. Flexible thermoplastic vinyl chloride polymers and acrylate terpolymers. 4,511,699, Cl. 525-205.000.
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., to General Tire & Rubber Company, The. Flexible thermoplastic vinyl chloride polymers. 4,511,700, Cl. 525-283.000.
Melcher, Alton R. Fishing rod holder with bite signaling means. 4,510,709, Cl. 43-17.000.
Mellinger, John C.: *See*—
McNally, William J.; and Mellinger, John C., 4,510,776, Cl. 68-3.00R.
Melocik, Grant C.; and Pickering, William, to Towmotor Corporation. Coil and coil driver control apparatus. 4,511,947, Cl. 361-191.000.
Melville, James B., to Lever Brothers Company. Tumble dryer products for depositing perfume. 4,511,495, Cl. 252-522.00A.
Memmi, Massimo: *See*—
Bruno, Roberto; and Memmi, Massimo, 4,511,633, Cl. 428-666.000.
Menary, Robert C.; and Doe, Peter E., to University of Tasmania, The. Enzyme inactivated hops. 4,511,587, Cl. 426-271.000.
Mendoza, Abel; and Otterbacher, Eric W., to Dow Chemical Company, The. 2-Ethoxyethyl 2-(4-hydroxyphenoxy)-propanoate. 4,511,731, Cl. 560-061.000.
Merck & Co., Inc.: *See*—
Chang, Michael N.; and Biftu, Tesfaye, 4,511,724, Cl. 548-452.000.
Meredith, Elmer E.: *See*—
Hanna, Thomas J.; Logsdon, Bill C.; and Meredith, Elmer E., 4,510,710, Cl. 43-42.130.
Merieux, Charles: *See*—
Play, Dominique; Bonneau, Marc; Merieux, Charles; Herbage, Daniel; and Comte, Philippe, 4,511,653, Cl. 435-69.000.
Merline Industries, Inc.: *See*—
Yealy, Carl F., 4,511,417, Cl. 156-73.500.
Messer Griesheim Industries, Inc.: *See*—
Wieland, Rolf H., 4,510,760, Cl. 62-49.000.
Metromail Corporation: *See*—
Barton, Delmar O.; and Simpson, Loran R., 4,511,130, Cl. 270-54.000.
Meuschke, Robert E.; and Schulties, Joseph R., to Westinghouse Electric Corp. Apparatus for dismantling and disposing of fuel assemblies. 4,511,499, Cl. 252-626.000.
Meyer, Hans. Device for measuring distances between two opposite surfaces. 4,510,691, Cl. 33-169.00R.
Meyer, Juergen, to Dr. Ing. h.c.F. Porsche AG. Table-like support installation for papers, especially at a covering frame of a sliding window. 4,511,104, Cl. 244-118.500.
Mezei, Tibor: *See*—
Budai, Zoltan; Kis-Tamas, Attila; Mezei, Tibor; Lay, Aranka; Vigh, Zoltan; and Sokorai, Agnes, 4,511,737, Cl. 564-257.000.
Michel, Jean-Pierre: *See*—
Tournier, Herve; Johansson, Allan A.; Sachetto, Jean-Pierre; Armanet, Jean-Michel; Michel, Jean-Pierre; and Roman, Alain, 4,511,433, Cl. 162-16.000.
Michel, Urien; and Guy, Theron M. P. J. Electronic event or bit generator having a predetermined occurrence rate with a predetermined event or bit distribution. 4,511,988, Cl. 364-717.000.
Micron International, Ltd.: *See*—
Rodriguez, Michael J., 4,511,886, Cl. 340-534.000.
Mikkelsen, Eric: *See*—
Falcoff, Allan F.; Mikkelsen, Eric; and Rodrigues, Allan B. J., 4,511,251, Cl. 356-246.000.
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Sugai, Kazuyoshi, to Mikoshiba, Nobuo; and Tsubouchi, Kazuo. Surface acoustic wave device using an elastic substrate and an aluminum nitride piezoelectric film. 4,511,816, Cl. 310-313.00A.
Milau, Julius S.: *See*—
Krishna, Coimbatore R.; and Milau, Julius S., 4,511,474, Cl. 210-512.100.
Millard, Maurice: *See*—
Fortunato, Alfred R.; Millard, Maurice; and Trzeciak, John R., 4,511,337, Cl. 434-43.000.
Miller, Anne K. M.; and Mason, Richard, to EKC Technology, Inc. Container for masks and pellicles. 4,511,038, Cl. 206-454.000.
Miller, Charles H., to Pathfinders Group, The. Decorative noncombustible coatings and methods of making the same. 4,511,406, Cl. 106-18.140.
Miller, Edward B.; and Eichelberger, Charles W., to General Electric Company. Method and apparatus for controlling distributed electrical loads. 4,511,895, Cl. 340-825.500.
Miller, John H.: *See*—
Ramge, Dennis L.; and Miller, John H., 4,511,328, Cl. 432-59.000.
Miller, Paul S.; and Ts'O, Paul O. P., to Johns Hopkins University, The. Process for selectively controlling unwanted expression or function

of foreign nucleic acids in animal or mammalian cells. 4,511,713, Cl. 536-27.000.

Miller, Richard F.; and Nicholson, Michael P., to Atlantic Richfield Company. Method for minimizing fouling of heat exchanger. 4,511,457, Cl. 208-48.0AA.

Miller, Richard J. Apparatus and method for automatically removing fingernail polish. 4,510,954, Cl. 132-75.000.

Miller, Ronald L.: *See*—
Neron, Joseph; Hudson, William S.; and Miller, Ronald L., 4,510,825, Cl. 81-57.290.

Miller, Stephen J., to Chevron Research Company. Low activity catalyst oligomerization process. 4,511,746, Cl. 585-323.000.

Miller, Stephen J., to Chevron Research Company. Olefin oligomerization with an activated catalyst. 4,511,750, Cl. 585-526.000.

Miller, Timothy J. E.; Jones, Donald W.; and Kalan, Gary L., to General Electric Company. Method of making a permanent magnet rotor. 4,510,680, Cl. 29-598.000.

Millet, George H., to Minnesota Mining and Manufacturing Company. Cyanoacrylate adhesive composition containing tannins. 4,511,686, Cl. 524-110.000.

Milsom, Robert F., to U.S. Philips Corporation. Acoustic surface wave device. 4,511,866, Cl. 333-194.000.

Mims, Donald S., to Texaco Inc. Bitumen production and substrate stimulation. 4,511,000, Cl. 166-303.000.

Mimura, Yoshiki: *See*—
Arai, Tetsuji; and Mimura, Yoshiki, 4,511,788, Cl. 219-405.000.

Minai, Masayoshi; and Katsura, Tadashi, to Sumitomo Chemical Company, Limited. Process for producing 4-cyclopentenones. 4,511,655, Cl. 435-149.000.

Minei, Masayuki: *See*—
Watanabe, Katsuhiro; Minei, Masayuki; and Horikoshi, Toshio, 4,510,951, Cl. 132-7.000.

Minker, Emil: *See*—
Szendrei, Kalman; Minker, Emil; Rozsa, Zsuzsanna; Koch, Lehel; and Wolf, Lajos, 4,511,559, Cl. 514-54.000.

Minnesota Mining and Manufacturing Company: *See*—
Busman, Stanley C.; and Chang, John C., 4,511,641, Cl. 430-158.000.
Fohrenkamm, Elsie A.; and Rousseau, Alan D., 4,511,646, Cl. 430-283.000.
Millet, George H., 4,511,686, Cl. 524-110.000.
Palensky, Frederick J.; and Siedle, Allen R., 4,511,715, Cl. 544-225.000.
Prato, Pietro, 4,510,882, Cl. 118-300.000.
Schumacher, Gerald F., 4,511,626, Cl. 428-425.600.
Tung, Chi F.; and Coderre, James C., 4,511,210, Cl. 350-105.000.

Mishima, Mitsutaka. Wristwatch protector. 4,511,261, Cl. 368-286.000.

Misselbrook, John, to American Cyanamid Company. Method for the preparation of water dispersible granular herbicidal compositions with increased thermal stability. 4,511,395, Cl. 71-121.000.

Mr. Christmas Incorporated: *See*—
Hermanson, Terry, 4,510,955, Cl. 135-25.00R.

Mr. Gasket Company: *See*—
Spiegel, Martin A.; and Roberts, Franklin D., 4,511,183, Cl. 301-37.00S.

Mistyurik, John D.: *See*—
Hamisch, Paul H., Jr.; and Mistyurik, John D., 4,511,422, Cl. 156-384.000.

Misu, Hiroshi: *See*—
Koike, Mitsuru; Kobayashi, Kesanao; Toyama, Tadao; Misu, Hiroshi; Tamoto, Koji; and Iwasaki, Masayuki, 4,511,645, Cl. 430-276.000.

Mita Industrial Company Limited: *See*—
Tsudaka, Hideaki; Washio, Takaji; Kozuka, Nobuhiko; Iseki, Masahide; Watanabe, Toshio; Kai, Masami; Yoshiyama, Toshio; and Sakata, Hiromi, 4,511,241, Cl. 355-14.0CU.

Mitchell, Terry L.; and Hodge, David H., to Dunbar Furniture, Inc. Pop-up electrical receptacle unit. 4,511,198, Cl. 339-34.000.

Mitsubishi Aluminum Kabushiki Kaisha: *See*—
Toma, Ken; Iida, Masanao; and Takeuchi, Yo, 4,511,632, Cl. 428-654.000.

Mitsubishi Chemical Industries Ltd.: *See*—
Tanaka, Toru; Gohko, Nobuaki; Kishiro, Osamu; and Murakami, Atsushi, 4,511,704, Cl. 526-125.000.

Mitsubishi Corporation: *See*—
Kudo, Shiro; and Hayashi, Mitsuyoshi, 4,511,588, Cl. 426-302.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Kawahira, Hiroto, 4,510,991, Cl. 165-41.000.
Komatsu, Fumiaki; Saegusa, Kazuyuki; Seshimo, Yu; and Yamashita, Norio, 4,510,767, Cl. 62-200.000.
Kouzai, Fumio; and Motoki, Yoshiaki, 4,511,890, Cl. 340-644.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Shimomura, Hiroshi; and Arai, Tatsuo, 4,511,293, Cl. 407-41.000.

Mitsui Toatsu Kagaku Kabushiki Kaisha: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,511,574, Cl. 514-371.000.

Mitsumori, Masaru, to Asahi Kasei Kogyo Kabushiki Kaisha. Mixed fuels. 4,511,364, Cl. 44-51.000.

Miura, Kazunori; Hattori, Yoshinori; and Matsuo, Yasushi, to NGK Spark Plug Co., Ltd. Sintered silicon nitride products and processes for fabrication thereof. 4,511,402, Cl. 75-233.000.

Miura, Kunio; and Ono, Takashi, to Nippondenso Co., Ltd. Navigator for vehicles. 4,511,973, Cl. 364-449.000.

Miyabayashi, Katsuyuki: *See*—
Tabata, Masaaki; and Miyabayashi, Katsuyuki, 4,511,172, Cl. 296-146.000.

Miyachi, Akio: *See*—
Fujimoto, Terunori; Shimizu, Nobuyoshi; Shimizu, Mutsuhiro; Yanagihara, Kazunori; Miyachi, Akio; and Inui, Tsuneo, 4,511,631, Cl. 428-632.000.

Miyadera, Yasuo: *See*—
Yoshida, Masatoshi; and Miyadera, Yasuo, 4,511,681, Cl. 523-310.000.

Miyahara, Norio: *See*—
Sampei, Takeshi; Miyahara, Norio; Nikaido, Tadanobu; Sato, Hiroaki; and Aoyama, Keizo, 4,512,012, Cl. 370-66.000.

Miyake, Masayoshi: *See*—
Kawaguchi, Munetaka; Nakabayashi, Hirohiko; and Miyake, Masayoshi, 4,511,624, Cl. 428-379.000.

Miyakoshi, Shinichi; and Tsunoda, Kazuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Rear suspension system for motorcycles. 4,511,013, Cl. 180-227.000.

Miyamae, Ryuichi; and Yasuda, Haruo, to Sharp Kabushiki Kaisha. Electronic sphygmomanometer. 4,510,942, Cl. 128-680.000.

Miyamae, Ryuichi, to Sharp Kabushiki Kaisha. Display inhibition in an electronic sphygmomanometer. 4,510,943, Cl. 128-680.000.

Miyamori, Hideaki; Takagi, Kenji; Sato, Shigeru; Takahashi, Fujio; and Ozawa, Mikio, to Nippon Kokan Koji Kabushiki Kaisha. Method for welding by magnetically driven arc. 4,511,784, Cl. 219-123.000.

Miyamoto, Noriaki: *See*—
Kawabata, Susumu; Inoue, Tetsuzo; Miyamoto, Noriaki; Shibuya, Masanobu; and Kaneko, Masashi, 4,510,745, Cl. 57-415.000.

Miyanaga, Satoshi: *See*—
Natori, Takeshi; Kobayashi, Yoji; Watanabe, Shigetaka; Shimizu, Katsumi; Matsumura, Ikuei; Namekawa, Yoshihiro; and Miyanaga, Satoshi, 4,510,974, Cl. 138-137.000.

Miyashita, Kunio: *See*—
Morinaga, Shigeki; Miyashita, Kunio; and Sugiura, Yasuyuki, 4,511,827, Cl. 318-254.000.

Miyata, Mitsuto: *See*—
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Miyata, Mitsuto, 4,511,975, Cl. 364-474.000.

Miyauchi, Hirotsugu: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,511,518, Cl. 260-543.00F.

Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, to UISE Industries, Ltd. Process for producing lower alkylene glycol, catalyst composition used therefor and process for production thereof. 4,511,744, Cl. 568-864.000.

Miyazaki, Naoki; Horiya, Keiichi; Shiozaki, Tsugio; and Takahama, Kazuhide, to Tokyo Electric Co., Ltd. Thermal printer. 4,511,903, Cl. 346-76.0PH.

Mizokami, Nobuo: *See*—
Tokutake, Kunihiko; Mizokami, Nobuo; and Tanaka, Hiroyuki, 4,510,807, Cl. 73-432.00R.

Mizuki, Nobuo. Light-shielding protective mask. 4,510,625, Cl. 2-8.000.

Mizutani, Tatsumi; Ohgata, Toshihide; and Komatsu, Hideo, to Hitachi, Ltd. Process for dry etching of aluminum and its alloy. 4,511,429, Cl. 156-643.000.

Mobil Oil Corporation: *See*—
Bowden, Edgar A.; Deline, Gordon R.; and Koeijmans, Gerard D., 4,511,999, Cl. 367-23.000.
Fitch, John L.; and Mullins, Lynn D., 4,510,997, Cl. 166-263.000.
Horodysky, Andrew G., 4,511,482, Cl. 252-34.000.
Morris, Kenneth L., 4,510,641, Cl. 15-118.000.
Prior, Maurice, 4,510,800, Cl. 73-153.000.
Quigley, M. Scott; and Russell, Gordon A., 4,510,801, Cl. 73-153.000.
Shim, Joosup, 4,511,481, Cl. 252-32.500.
Wright, Bernard S.; Hsia, Chung H.; and Owen, Hartley, 4,511,747, Cl. 585-415.000.
Yan, Tsoung Y.; and Shu, Paul, 4,511,459, Cl. 208-127.000.

Mochizuki, Daisuke; Ohnishi, Souichi; and Komai, Kensaku, to Sharp Kabushiki Kaisha. Electronic calculating device with faculties of detecting reproduction level of data applied thereto. 4,512,027, Cl. 377-16.000.

Modern Machine and Grinding, Inc.: *See*—
Lorince, Julius, 4,510,689, Cl. 30-347.000.

Moelands, Antonius G.: *See*—
Van der Valk, Nicolaas J. L.; Moelands, Antonius G.; and Schmale, Peter C., 4,511,915, Cl. 358-17.000.

Moeller, Matthias; and Kausche, Helmold, to Siemens Aktiengesellschaft. Amorphous silicon solar cells and a method of producing the same. 4,511,756, Cl. 136-258.000.

Mogyorodi, Ferenc; Koppany, Eniko; Bodi, Tibor; Balogh, Karoly; Toth, Istvan; Bognar, Rezso; Makleit, Sandor; Litkei, Gyorgy; Rakosi, Miklos; and Dinya, Zoltan, to Eszakmagyarorszagi Vegyimuvek. Process for the preparation of substituted chloroacetanilides. 4,511,736, Cl. 564-214.000.

Moisson, Marc F. L., to N.V. Raychem S.A. Cable sleeve liner. 4,511,611, Cl. 428-35.000.

Moldovan, Nicholas: *See*—
DiStefano, Ralph D.; and Moldovan, Nicholas, 4,511,438, Cl. 204-4.000.

Molenaar, Ronald N.: *See*—
Ploegaert, Hendrikus T.; Molenaar, Ronald N.; and Butter, Johannes A. M., 4,510,793, Cl. 73-86.000.

Molinatto, Bruno, to Componenti Grafici S.r.l. Gravure pressure rollers with axis of variable shape. 4,510,865, Cl. 101-153.000.
Molins, Ltd.: *See*—
Arthur, Hugh M., 4,511,420, Cl. 156-356.000.
Molins, PLC: *See*—
Preston, Edward G.; and Stewart, David B., 4,510,949, Cl. 131-109.00R.
Moller, Reinfried, to Expert Maschinenbau GmbH. Scissors lift table. 4,511,110, Cl. 248-421.000.
Molnar, Sandor, to Swiss Aluminium Ltd. Cathode for a fused salt reduction cell. 4,511,449, Cl. 204-243.00R.
Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr.; and Mistyurik, John D., 4,511,422, Cl. 156-384.000.
Monnais, Christian; Cotteret, Jean; and Bugaut, Andree , to L'Oreal. Dyeing compositions based on oxidation dyestuff precursors and on nitro benzene dyestuffs and their use for dyeing keratin fibres. 4,511,360, Cl. 8-405.000.
Monsanto Company: *See*—
Hobbs, Charles F., 4,511,672, Cl. 502-243.000.
Montgomery, John A.: *See*—
Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,511,721, Cl. 546-308.000.
Montmartin, Henri: *See*—
Saint-Prix, Robert; and Montmartin, Henri, 4,511,280, Cl. 403-274.000.
Moody, Roy A.: *See*—
Yudis, Donald W.; and Moody, Roy A., 4,510,649, Cl. 24-16.0PB.
Moore, Benson R.; and Gnacinski, Leonard T., to MagneTek, Inc. Lubrication improvement for variable speed drives. 4,511,347, Cl. 474-43.000.
Moore Business Forms, Inc.: *See*—
Jones, Charles E., 4,511,298, Cl. 412-34.000.
Moore, James G.; Obey, James H.; and Pinkel, Edward B., to White Consolidated Industries, Inc. Process for evaporative stripping. 4,511,431, Cl. 159-47.100.
Moore, Joseph, to Hustler Conveyor Company. Machine for dislodging cans from a compressed bale of cans. 4,511,302, Cl. 414-327.000.
Moracz, Donald J.: *See*—
Ferguson, Blake L.; and Moracz, Donald J., 4,510,788, Cl. 72-377.000.
Moran, James H.; and Rau, Rama N., to Schlumberger Technology Corporation. Electromagnetic logging device and method with dielectric guiding layer. 4,511,842, Cl. 324-338.000.
Morel, Jacques; and Tallon, Jacques, to Compagnie Industrielle des Telecommunications Cita-Alcatel; and Compagnie Industrielle des Telecommunications Cita-Alcatel. Apparatus for measuring and displaying leakage rates in a tracer gas leakage detector. 4,510,792, Cl. 73-40.700.
Moreuil, Rene , to Arconthorn Limited. Drug for stimulating hepatic cell homeostasis and for restoring the functional capacity of the hepatocytes. 4,511,580, Cl. 514-578.000.
Morgan Construction Company: *See*—
DuFries, Ronald W., 4,511,096, Cl. 242-47.010.
Morgan, Paul M., to Lakeshore Equipment & Supply Co. Material spreader. 4,511,090, Cl. 239-666.000.
Mori, Kei. Solar ray collection apparatus. 4,511,755, Cl. 136-246.000.
Mori, Kenji; and Uematsu, Tamon, to Sumitomo Chemical Company, Limited. Production method of an insect pheromone. 4,511,726, Cl. 549-283.000.
Mori, Mitsuo; Suzuki, Yoshihisa; Muramatsu, Shigeru; and Takasu, Sigeru, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Weighting device for drafting means. 4,510,648, Cl. 19-266.000.
Morichika, Toshiaki: *See*—
Konoki, Keizo; Shinohara, Takanobu; Kochi, Ikuyoshi; Shibata, Keiichi; Nishihara, Hisakatsu; Morichika, Toshiaki; Sugitani, Junichi; and Tsuchida, Koji, 4,510,988, Cl. 164-102.000.
Morihara, Kazuyuki; Oka, Tatsushi; and Tsuzuki, Hiroshige, to Shionogi & Co., Ltd. Semi-synthesis of human insulin. 4,511,505, Cl. 260-112.700.
Morimoto, Makoto: *See*—
Tomita, Fusao; Tamaoki, Tatsuya; Shirahata, Kunikatsu; Iida, Takao; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,511,560, Cl. 514-27.000.
Morimoto, Yoshiro: *See*—
Yamamuro, Sigeaki; Hirano, Hiroyuki; Morimoto, Yoshiro; and Tanaka, Yoshikazu, 4,510,822, Cl. 74-733.000.
Morinaga, Shigeki; Miyashita, Kunio; and Sugiura, Yasuyuki, to Hitachi, Ltd. Apparatus for driving a polyphase brushless motor with a suppressed torque ripple. 4,511,827, Cl. 318-254.000.
Moriyama, Hideo: *See*—
Kakino, Shigeru; Hattori, Katsuhide; Fukatsu, Yoshiaki; Moriyama, Hideo; and Sakakibara, Hidekazu, 4,511,412, Cl. 149-109.600.
Morris, Kenneth L., to Mobil Oil Corporation. Scrubbing pad. 4,510,641, Cl. 15-118.000.
Morrisey, Edward J., to United States of America, Air Force. Compartmented, filament wound, one-piece aircraft fuel tanks. 4,511,105, Cl. 244-135.00R.
Morrish, William R.: *See*—
Green, Lawrence E.; and Morrish, William R., 4,511,179, Cl. 297-349.000.
Motiwala, M. Arif; and Sutherland, Jack L., to Harris Corporation. Programmable multitone DPSK modulator. 4,511,862, Cl. 332-16.00R.
Motley, Robert W.; and Glanz, James, to United States of America, Energy. Plasma sweeper to control the coupling of RF power to a magnetically confined plasma. 4,511,782, Cl. 219-121.00P.
Motoki, Yoshiaki: *See*—
Kouzai, Fumio; and Motoki, Yoshiaki, 4,511,890, Cl. 340-644.000.
Motoren-und Turbinen-Union Munchen GmbH: *See*—
Huther, Werner; and Rossmann, Axel, 4,511,612, Cl. 428-36.000.
Motorenfabrik Hatz GmbH & Co. KG: *See*—
Hatz, Ernst; and Absenger, Erich, 4,510,897, Cl. 123-90.480.
Motorola, Inc.: *See*—
Allen, Gordon H., 4,511,809, Cl. 307-254.000.
Fukuta, Masaru, 4,512,030, Cl. 377-107.000.
Patel, Bakulesh B., 4,511,768, Cl. 179-146.00R.
Remedi, James J.; Reid, Don G.; and Ure, Lynette, 4,511,914, Cl. 357-45.000.
Victor, Alan M.; and Davis, Darrell E., 4,512,035, Cl. 455-165.000.
Wurzburg, Henry, 4,511,851, Cl. 330-51.000.
Mott, Philip J.; and Gallaher, Kenneth R., to Borg-Warner Corporation. Precise pressure regulator for a variable output pump. 4,510,962, Cl. 137-102.000.
Mottate, Tatsuo, to Nippon Thompson Co., Ltd. Endless linear movement roller bearing. 4,511,189, Cl. 308-6.00C.
Mouzin, Gilbert: *See*—
Pitet, Guy; Cousse, Henri; and Mouzin, Gilbert, 4,511,566, Cl. 514-242.000.
Mt. Sinai Medical Center of Greater Miami: *See*—
Varga, Sandor I.; Dougherty, Richard L.; Dandy, Donny C.; and Thomas, Willie J., 4,511,158, Cl. 280-292.000.
MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
Doell, Hermann, 4,511,016, Cl. 184-6.110.
Mucheyer, Norbert; and Kauss, Wolfgang, to Mannesman Rexroth GmbH. Apparatus for adjusting the position of an adjustable element. 4,510,847, Cl. 91-461.000.
Muesse, Milton J.: *See*—
Duval, Henry H.; Kennedy, Donald; and Muesse, Milton J., 4,511,283, Cl. 404-107.000.
Muller-Girard, Otto, to Ratnik Industries, Inc. Self-regulating hydrant. 4,511,083, Cl. 239-14.000.
Muller, Hans, to Grapha-Holding AG. Gathering machine for paper sheets or the like. 4,511,132, Cl. 270-58.000.
Muller, Hans, to DrM, Dr. Muller AG. Filter apparatus for continuously thickening suspensions. 4,511,471, Cl. 210-323.200.
Muller, Herbert. Holder for filter bags for preparing tea and the like. 4,510,654, Cl. 24-344.000.
Muller, Mathias, to Haver & Becker. Machine for filling and closing bags of synthetic plastic material. 4,510,736, Cl. 53-567.000.
Mullins, Lynn D.: *See*—
Fitch, John L.; and Mullins, Lynn D., 4,510,997, Cl. 56-263.000.
Multi-Arc Vacuum Systems Inc.: *See*—
Brandolf, Henry E., 4,511,593, Cl. 427-37.000.
Multrus, Vladimir, to Honeywell GmbH. Pneumatic controller. 4,510,961, Cl. 137-86.000.
Muncie Power Product Inc.: *See*—
Macy, Lawrence E., 4,510,899, Cl. 123-198.00D.
Munson, Robert E.; and Haddad, Hussain A., to Ball Corporation. Apparatus and method for transfer of r.f. energy through a mechanically rotatable joint. 4,511,868, Cl. 333-257.000.
Murai, Ashita: *See*—
Okamura, Hisashi; Sakaguchi, Shinji; Takahashi, Osamu; and Murai, Ashita, 4,511,644, Cl. 430-219.000.
Murakami, Atsushi: *See*—
Tanaka, Toru; Gohko, Nobuaki; Kishiro, Osamu; and Murakami, Atsushi, 4,511,704, Cl. 526-125.000.
Murakami, Teruo; and Hoshino, Isao, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical type information read/write apparatus. 4,512,006, Cl. 369-50.000.
Muramatsu, Shigeru: *See*—
Mori, Mitsuo; Suzuki, Yoshihisa; Muramatsu, Shigeru; and Takasu, Sigeru, 4,510,648, Cl. 19-266.000.
Murata Manufacturing Co., Ltd.: *See*—
Nakamura, Takeshi; Nishiyama, Hiroshi; Matsuda, Satoshi; and Matsumoto, Ikuo, 4,511,821, Cl. 310-354.000.
Ogawa, Toshio; and Kittaka, Toshihiko, 4,511,483, Cl. 252-62.900.
Murayama, Ken: *See*—
Shimada, Satoshi; Murayama, Ken; Kobori, Shigeyuki; and Kawakami, Kanji, 4,511,878, Cl. 338-4.000.
Murgai, Ashok: *See*—
Ghosh, Hitendra; Murgai, Ashok; and Westdorp, Wolfgang A., 4,511,428, Cl. 156-601.000.
Murnan, Leo R.: *See*—
Friesz, Robert E., 4,510,663, Cl. 29-429.000.
Muroi, Katsumi: *See*—
Nakamura, Yoichi; Yamamoto, Akio; Nogita, Shunsuke; Kuge, Toshio; and Muroi, Katsumi, 4,511,363, Cl. 44-1.00G.
Murphy, John W.: *See*—
Bogaerts, Leo C.; and Murphy, John W., 4,510,828, Cl. 82-4.00A.
Murphy, Michael F. Fence dropper. 4,510,721, Cl. 52-40.000.
Murray, Alan B.: *See*—
Eaton, William L.; and Murray, Alan B., 4,511,823, Cl. 315-226.000.
Murray, Larry N.: *See*—
Wilt, Henry E.; and Murray, Larry N., 4,511,088, Cl. 239-455.000.
Musashi Co., Ltd.: *See*—
Kawano, Hikaru; Sato, Koji; and Nogi, Hiroyoshi, 4,511,301, Cl. 414-43.000.
Mutl, Silvestr: *See*—
Hereit, Frantisek; and Mutl, Silvestr, 4,511,467, Cl. 210-173.000.

Nagahira, Jyoji: *See*—
Suzuki, Koji; Kuroda, Kouki; and Nagahira, Jyoji, 4,511,240, Cl. 355-14.00R.
Nagai, Isao: *See*—
Saito, Noboru; Satake, Takeshi; Aoki, Ryuji; and Nagai, Isao, 4,511,671, Cl. 502-242.000.
Nagai, Shigeo, to Nisshin Kogyo Kabushiki Kaisha. Clutch brake apparatus for farm work machinery or other apparatus. 4,511,023, Cl. 192-18.00R.
Nagamine, Tsuyoshi: *See*—
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Miyata, Mitsuto, 4,511,975, Cl. 364-474.000.
Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Arithmetic operation circuit for finding a square root of a sum of squared values. 4,511,991, Cl. 364-814.000.
Nagano, Takahiro, to Hitachi, Ltd. Gate-turn off thyristor with optimized anode shorting resistance, R_{so}. 4,511,913, Cl. 357-38.000.
Nagao, Makoto; and Nahara, Akira, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,511,635, Cl. 428-694.000.
Nagashima, Masayoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Thermal transfer type printing apparatus. 4,511,902, Cl. 346-76.0PH.
Nagata, Wataru: *See*—
Tokuyama, Kanji; Nishitani, Yasuhiro; Tanaka, Mamoru; and Nagata, Wataru, 4,511,738, Cl. 568-14.000.
Nagato, Yoshio; and Soroi, Kazunori, to Kyocera Corporation. Decorative hard golden ceramic article. 4,511,665, Cl. 501-96.000.
Nagy, Alex; and Herlein, Dick, to Fairchild Camera and Instrument Corporation. Deskewing time-critical signals in automatic test equipment. 4,511,846, Cl. 328-164.000.
Nahara, Akira: *See*—
Nagao, Makoto; and Nahara, Akira, 4,511,635, Cl. 428-694.000.
Naito, Kazuo: *See*—
Tanuma, Itsuo; Takeichi, Hideo; Fukuura, Yukio; Ohyachi, Tomio; and Naito, Kazuo, 4,511,627, Cl. 428-429.000.
Nakabayashi, Hirohiko: *See*—
Kawaguchi, Munetaka; Nakabayashi, Hirohiko; and Miyake, Masayoshi, 4,511,624, Cl. 428-379.000.
Nakajima, Isao: *See*—
Takahashi, Kazue; Okuna, Kenzi; Nakajima, Isao; Harada, Mineo; and Kako, Yutaka, 4,511,269, Cl. 400-124.000.
Nakajima, Kichio: *See*—
Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,510,750, Cl. 60-443.000.
Nakajima, Tsuyoshi: *See*—
Watanabe, Nobuatsu; Nakajima, Tsuyoshi; and Kawaguchi, Masayuki, 4,511,493, Cl. 252-507.000.
Nakamura, Kunihiko: *See*—
Yamada, Noboru; and Nakamura, Kunihiko, 4,511,136, Cl. 271-187.000.
Nakamura, Takeshi; Nishiyama, Hiroshi; Matsuda, Satoshi; and Matsumoto, Ikuo, to Murata Manufacturing Co., Ltd. Support structure for piezoelectric vibrator. 4,511,821, Cl. 310-354.000.
Nakamura, Toshiro; and Watanabe, Tetsuya, to Nakamura, Toshiro. Insole. 4,510,699, Cl. 36-43.000.
Nakamura, Yasuo: *See*—
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,511,744, Cl. 568-864.000.
Nakamura, Yoichi; Yamamoto, Akio; Nogita, Shunsuke; Kuge, Toshio; and Muroi, Katsumi, to Hitachi, Ltd. Method of upgrading low-rank coal. 4,511,363, Cl. 44-1.00G.
Nakane, Masao; Takahashi, Motohiko; and Ogawa, Takaki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Load condition indicating method and apparatus for forklift truck. 4,511,974, Cl. 364-463.000.
Nakanishi, Michio; and Nakashima, Naoki, to Daicel Chemical Industries, Ltd. Polycaprolactone composition. 4,511,687, Cl. 524-270.000.
Nakano, Takuo: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,511,574, Cl. 514-371.000.
Nakano, Tomio: *See*—
Nozaki, Shigeki; Takemae, Yoshihiro; and Nakano, Tomio, 4,511,997, Cl. 365-189.000.
Nakashima, Masuo: *See*—
Andow, Fumio; and Nakashima, Masuo, 4,511,981, Cl. 364-492.000.
Nakashima, Naoki: *See*—
Nakanishi, Michio; and Nakashima, Naoki, 4,511,687, Cl. 524-270.000.
Nakasuji, Kazuyuki: *See*—
Hayashi, Chihiro; and Nakasuji, Kazuyuki, 4,510,787, Cl. 72-368.000.
Nakatani, Hiroshi; and Yamamoto, Hachizou, to Sharp Kabushiki Kaisha. Money information print control system. 4,511,891, Cl. 340-734.000.
Nakayama, Toshikazu, to Kirin Beer Kabushiki Kaisha. Article holding apparatus of rotary type. 4,511,025, Cl. 198-377.000.
Nakayama, Yasunobu; Sato, Yasuji; and Kunii, Takeshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Telephonic display device. 4,511,764, Cl. 179-90.0AN.
Nakazawa, Koji: *See*—
Ideno, Eizo; Fukushi, Shinichi; Tai, Masahiko; Nakazawa, Koji; and Fujita, Toshihito, 4,511,095, Cl. 242-18.00G.
Namba, Hiromi, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical character recognition apparatus. 4,512,032, Cl. 382-9.000.
Namekawa, Yoshihiro: *See*—
Natori, Takeshi; Kobayashi, Yoji; Watanabe, Shigetaka; Shimizu, Katsumi; Matsumura, Ikuei; Namekawa, Yoshihiro; and Miyanaga, Satoshi, 4,510,974, Cl. 138-137.000.
Nara Machinery Co., Ltd.: *See*—
Ohkoshi, Tatsuo; and Kobayashi, Chikara, 4,511,093, Cl. 241-60.000.
Naruse, Toshihisa: *See*—
Ishino, Yoshitane; Naruse, Toshihisa; and Sawano, Toshiyuki, 4,510,705, Cl. 37-54.000.
Nash, Randy D.; and Wong, Wai C., to AT&T Bell Laboratories. Simultaneous transmission of speech and data over an analog channel. 4,512,013, Cl. 370-69.100.
Nassoy, Jacques; and Protin, Bernard. Process for pre-setting mounting holes for cutting and ejection tools of an automatic platen press. 4,510,667, Cl. 29-526.00R.
Nation Enterprises, Inc.: *See*—
Bauer, Marshall, 4,511,324, Cl. 425-398.000.
National Research Development Corporation: *See*—
Fourcin, Adrian J.; Howard, David M.; and Walliker, John R., 4,510,936, Cl. 128-419.00R.
National Viewtech Corp.: *See*—
Bauer, Michael T., 4,511,927, Cl. 358-250.000.
Natori, Takeshi; Kobayashi, Yoji; Watanabe, Shigetaka; Shimizu, Katsumi; Matsumura, Ikuei; Namekawa, Yoshihiro; and Miyanaga, Satoshi, to Hitachi Cable Ltd. Fluid conveying hose. 4,510,974, Cl. 138-137.000.
Nautilus Sports/Medical Industries, Inc.: *See*—
Jones, Arthur A., 4,511,137, Cl. 272-118.000.
Nawrata, Gunter: *See*—
Fidi, Werner; and Nawrata, Gunter, 4,512,009, Cl. 369-170.000.
Nazem, Faramarz; Didchenko, Rostislav; and Fink, David, to Union Carbide Corporation. Physical conversion of latent mesophase molecules to oriented molecules. 4,511,625, Cl. 428-401.000.
NCR Corporation: *See*—
Penton, Perry W., 4,511,961, Cl. 364-200.000.
NEC Corporation: *See*—
Fukuchi, Hiromichi, 4,511,907, Cl. 346-140.00R.
Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek: *See*—
Wesseling, Karel H., 4,510,940, Cl. 128-667.000.
Neefe, Charles W. Passive hydrogel fuel generator. 4,511,450, Cl. 204-278.000.
Negev Phosphates Ltd.: *See*—
Keren, Yehuda; Carmon, Shmuel; Behar, Meyer; and Axelrod, Shimshon, 4,511,543, Cl. 423-167.000.
Nemeth, Joseph; and Kowalski, Charles I., to Champion Spark Plug Company. Carbon resistor and method for producing same. 4,511,524, Cl. 264-61.000.
Neppl, Franz: *See*—
Schwabe, Ulrich; Neppl, Franz; and Hieber, Konrad, 4,510,670, Cl. 29-571.000.
Neron, Joseph; Hudson, William S.; and Miller, Ronald L. Multi-position drive ratchet wrench. 4,510,825, Cl. 81-57.290.
Netcom, Inc.: *See*—
MacKenzie, Keith W., 4,511,820, Cl. 310-353.000.
Neustadt, Bernard R.: *See*—
Smith, Elizabeth M.; Doll, Ronald J.; and Neustadt, Bernard R., 4,511,569, Cl. 514-290.000.
Neuzil, Richard W.: *See*—
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., 4,511,514, Cl. 260-419.000.
Neville, Richard E. G., to AMF Incorporated. Apparatus for the continuous measurement of bulk density material such as cut tobacco. 4,510,808, Cl. 73-433.000.
New York State Energy Research and Development Authority: *See*—
Walmet, Gunnar E., 4,510,920, Cl. 126-415.000.
Newton, Steven A.; and Bowers, John E., to Leland Stanford Junior University, The Board of Trustees of the. Fiber optic data distributor. 4,511,207, Cl. 350-96.150.
NGK Spark Plug Co., Ltd.: *See*—
Miura, Kazunori; Hattori, Yoshinori; and Matsuo, Yasushi, 4,511,402, Cl. 75-233.000.
Nichols, Walter A.: *See*—
Keritsis, Gus D.; and Nichols, Walter A., 4,510,950, Cl. 131-353.000.
Nicholson, Michael P.: *See*—
Miller, Richard F.; and Nicholson, Michael P., 4,511,457, Cl. 208-48.0AA.
Nicholson, Myron D.; and Chiu, Herman S., to Union Carbide Corporation. Method for inhibiting discoloration on cellulose food casings. 4,511,613, Cl. 428-36.000.
Nici, Richard J.; Schramm, George W.; and Sharp, John B., to AT&T Information Systems. Digital dual channel communication terminal. 4,512,017, Cl. 370-110.100.
Nici, Richard J.: *See*—
Fulcomer, Emanuel J., Jr.; Nici, Richard J.; Poteat, Vance E.; Schramm, George W.; Sharp, John B.; and Winseck, Michael M., Jr., 4,512,016, Cl. 370-110.100.
Nickisch, Klaus: *See*—
Laurent, Henry; Nickisch, Klaus; Bittler, Dieter; Wiechert, Rudolf; and Losert, Wolfgang, 4,511,565, Cl. 514-173.000.
Nickol, Friedrich W., to VDO Adolf Schindling AG. Solderable layer system. 4,511,634, Cl. 428-686.000.
Nicol, Irene L. Dose indicator closure. 4,511,050, Cl. 215-219.000.

Nicolas, Alain; and Chapelain, Jean, to Thomson-CSF - Telephone. Decentralized arbitration device for several processing units of a multiprocessor system. 4,511,959, Cl. 364-200.000.
Nicolas, Jacques; and Raso, Roland, to Manufacture de Machines du Haut-Rhin, "Manurhin". Rotating cage security device for a gyratory projectile. 4,510,869, Cl. 102-240.000.
Niederdellmann, Georg; and Grigat, Ernst, to Bayer Aktiengesellschaft. Process for the continuous high temperature glycolytic cleavage of polyurethane plastics waste in screw machines. 4,511,680, Cl. 521-49.500.
Nielsen, Arnold D., to Ford Motor Company. Solenoid switching driver with fast current decay from initial peak current. 4,511,945, Cl. 361-154.000.
Nielsen, Steven T.; and Lee, Carleton C., to Beckman Instruments, Inc. Ultracentrifuge tube with multiple chambers. 4,511,349, Cl. 494-16.000.
Nihon Medi-Physics Co., Ltd.: *See—*
Yokoyama, Akira; Arano, Yasushi; and Hosotani, Takeo, 4,511,550, Cl. 424-1.100.
Niiro, Makoto: *See—*
Ohira, Takao; Okihara, Daijiro; and Niiro, Makoto, 4,511,934, Cl. 360-55.000.
Nijboer, Sjoerd: *See—*
Sahakian, Diran R.; Pellerin, Lucien; and Nijboer, Sjoerd, 4,511,769, Cl. 200-6.00A.
Nikaido, Tadanobu: *See—*
Sampei, Takeshi; Miyahara, Norio; Nikaido, Tadanobu; Sato, Hiroaki; and Aoyama, Keizo, 4,512,012, Cl. 370-66.000.
Nilsson, Clees T.: *See—*
Jakobsen, Kjell M.; and Nilsson, Clees T., 4,511,322, Cl. 425-384.000.
Ninagawa, Yoichi; Yamada, Osamu; Renge, Tsumoru; Kyo, Sunao; Osaki, Takayoshi; and Kushida, Koichi, to Kuraray Company, Ltd. Process for producing isoprene. 4,511,751, Cl. 585-608.000.
Ninomiya, Masakazu; Suda, Toshi; Omori, Norio; Akiyama, Susumu; and Fukaya, Hiroyasu, to Nippondenso Co., Ltd. Ignition timing control method and apparatus for internal combustion engines. 4,510,910, Cl. 123-486.000.
Nippon Electric Co., Ltd.: *See—*
Iijima, Yukihiko; and Kobayashi, Sadame, 4,511,920, Cl. 358-139.000.
Yukawa, Akira, 4,511,810, Cl. 307-355.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Kumano, Shinji, 4,510,839, Cl. 84-434.000.
Yokoyama, Kenji, 4,512,008, Cl. 369-134.000.
Nippon Kogaku K.K.: *See—*
Hirose, Hideo, 4,511,223, Cl. 350-523.000.
Kazami, Kazuyuki; and Ohtsubo, Yoshiaki, 4,511,233, Cl. 354-418.000.
Nippon Kokan Koji Kabushiki Kaisha: *See—*
Miyamori, Hideaki; Takagi, Kenji; Sato, Shigeru; Takahashi, Fujio; and Ozawa, Mikio, 4,511,784, Cl. 219-123.000.
Nippon Oil Co., Ltd.: *See—*
Kudoh, Michio; Matsuno, Mitsuo; and Imai, Hirosuke, 4,511,748, Cl. 585-467.000.
Nippon Oil and Fats Co. Ltd.: *See—*
Kakino, Shigeru; Hattori, Katsuhide; Fukatsu, Yoshiaki; Moriyama, Hideo; and Sakakibara, Hidekazu, 4,511,412, Cl. 149-109.600.
Matsui, Fumio; Aono, Shin; Sakai, Hiroshi; Hattori, Katsuhide; and Kakino, Shigeru, 4,511,414, Cl. 149-109.600.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Saito, Noboru; Satake, Takeshi; Aoki, Ryuji; and Nagai, Isao, 4,511,671, Cl. 502-242.000.
Nippon Soken, Inc.: *See—*
Taguchi, Masahiro; Kuwakado, Satosi; and Tsuge, Noboru, 4,510,749, Cl. 60-286.000.
Tsuge, Noboru; Taguchi, Masahiro; and Kuwakado, Satosi, 4,511,097, Cl. 242-55.000.
Nippon Telegraph and Telephone Public Corp.: *See—*
Higashi, Kensaku; Yano, Haruhiko; Sato, Hirotsugu; Sukegawa, Ken; and Ooba, Yuji, 4,511,642, Cl. 430-161.000.
Nippon Thompson Co., Ltd.: *See—*
Mottate, Tatsuo, 4,511,189, Cl. 308-6.00C.
Nippondenso Co., Ltd.: *See—*
Miura, Kunio; and Ono, Takashi, 4,511,973, Cl. 364-449.000.
Ninomiya, Masakazu; Suda, Toshi; Omori, Norio; Akiyama, Susumu; and Fukaya, Hiroyasu, 4,510,910, Cl. 123-486.000.
Nishihara, Hisakatsu: *See—*
Konoki, Keizo; Shinohara, Takanobu; Kochi, Ikuyoshi; Shibata, Keiichi; Nishihara, Hisakatsu; Morichika, Toshiaki; Sugitani, Junichi; and Tsuchida, Koji, 4,510,988, Cl. 164-102.000.
Nishikawa, Hisashi; Suzuki, Satoshi; Hirata, Masanobu; Sakamoto, Koichiro; Fujisawa, Ikuo; and Takeno, Shozo, to Tokyo Electric Co., Ltd. Strain gauge with reduced creep phenomenon by improved insulation layering. 4,511,877, Cl. 338-2.000.
Nishimatsu, Masaharu: *See—*
Konno, Ryozo; Sugai, Makio; Kubota, Yuichi; Nishimatsu, Masaharu; Isobe, Yukihiro; Tanaka, Kazushi; and Shinoura, Osamu, 4,511,629, Cl. 428-522.000.
Nishitani, Yasuhiro: *See—*
Tokuyama, Kanji; Nishitani, Yasuhiro; Tanaka, Mamoru; and Nagata, Wataru, 4,511,738, Cl. 568-14.000.
Nishiyama, Haruo, to Sharp Kabushiki Kaisha. Size detecting device of a copy document suitable for electrophotographic copying machine. 4,511,246, Cl. 355-75.000.
Nishiyama, Hiroshi: *See—*
Nakamura, Takeshi; Nishiyama, Hiroshi; Matsuda, Satoshi; and Matsumoto, Ikuo, 4,511,821, Cl. 310-354.000.
Nissan Motor Co., Ltd.: *See—*
Eto, Yoshiyuki, 4,511,673, Cl. 502-525.000.
Ishikawa, Yasuki; Endo, Hiroshi; Sone, Masazumi; and Imai, Iwao, 4,510,915, Cl. 123-620.000.
Kawamoto, Tamio; and Hiraiwa, Kazuyoshi, 4,510,817, Cl. 74-477.000.
Yamamuro, Sigeaki; Hirano, Hiroyuki; Morimoto, Yoshiro; and Tanaka, Yoshikazu, 4,510,822, Cl. 74-733.000.
Nissen, Axel; Horner, Michael; Horn, Dieter; Lueddecke, Erik; and Teege, Gernot, to BASF Aktiengesellschaft. Chroman derivatives and stabilized polypropylene composition. 4,511,685, Cl. 524-110.000.
Nisshin Kogyo Kabushiki Kaisha: *See—*
Nagai, Shigeo, 4,511,023, Cl. 192-18.00R.
Nitrokemia Ipartelepek: *See—*
Gorog, Katalin; Dudar, Erzebet; Gardi, Ivan; Kocsis, Maria; Gaal, Sandor; and Tasnadi, Marta, 4,511,714, Cl. 548-215.000.
Nitto Boseki Co., Ltd.: *See—*
Ideno, Eizo; Fukushi, Shinichi; Tai, Masahiko; Nakazawa, Koji; and Fujita, Toshihito, 4,511,095, Cl. 242-18.00G.
Nixon, Ivor G. Refining of metals. 4,511,396, Cl. 75-51.100.
NL Industries, Inc.: *See—*
Roesler, Richard F., 4,510,696, Cl. 33-304.000.
Noble, John W., to Westvaco Corporation. Adhesive latex polymerization surfactants. 4,511,691, Cl. 524-745.000.
Nogi, Hiroyoshi: *See—*
Kawano, Hikaru; Sato, Koji; and Nogi, Hiroyoshi, 4,511,301, Cl. 414-43.000.
Nogita, Shunsuke: *See—*
Nakamura, Yoichi; Yamamoto, Akio; Nogita, Shunsuke; Kuge, Toshio; and Muroi, Katsumi, 4,511,363, Cl. 44-1.00G.
Nojiri, Shoji: *See—*
Kano , Yoshiharu; Fujisawa, Makoto; Nojiri, Shoji; and Tanaka, Yoshikazu, 4,512,015, Cl. 370-110.100.
Nonaka, Chiaki, to Sony Corporation. Apparatus for optically reproducing an information signal recorded on a record disc. 4,512,004, Cl. 369-45.000.
Nonomura, Keisaku: *See—*
Takamatsu, Toshiaki; and Nonomura, Keisaku, 4,511,217, Cl. 350-336.000.
Norden Packaging Machinery AB: *See—*
Linner, Hans, 4,511,426, Cl. 156-497.000.
North American Philips Corporation: *See—*
Akse, James R.; and Long, Stanley A., 4,511,601, Cl. 427-79.000.
Wittig, Karl R., 4,511,855, Cl. 330-279.000.
North, Henry; and Fauconnier, William R. Milling apparatus. 4,511,092, Cl. 241-49.000.
North, Henry; and Fauconnier, William R. Cavitators. 4,511,254, Cl. 366-118.000.
Northern Engineering Industries plc: *See—*
Somerville, William M., 4,511,807, Cl. 290-44.000.
Northern Telecom Inc.: *See—*
Sims, Dewey M., Jr., 4,511,936, Cl. 360-69.000.
Northern Telecom Limited: *See—*
Bunner, Charles B. D.; and Brombal, David S., 4,511,950, Cl. 361-413.000.
Shah, Mahesh, 4,511,766, Cl. 179-99.00A.
Wetzel, David L.; and Shah, Mahesh, 4,511,767, Cl. 179-99.00A.
Norton Christensen, Inc.: *See—*
Jung, Thomas; and Heidemann, Gerhard, 4,511,007, Cl. 175-297.000.
Norton Company: *See—*
Hsia, Min A., 4,511,519, Cl. 261-94.000.
Norwood Industries, Inc.: *See—*
McCartney, John R., 4,511,605, Cl. 427-246.000.
Nosaka, Isao: *See—*
Kawata, Shun; Nosaka, Isao; and Katakura, Hiroshi, 4,511,237, Cl. 355-3.00R.
Nottingham, John R.: *See—*
Spirk, John W., Jr.; and Nottingham, John R., 4,511,341, Cl. 446-9.000.
Nowinski, Robert C.; and Hoffman, Allan S., to Genetic Systems Corporation. Polymerizable compounds and methods for preparing synthetic polymers that integrally contain polypeptides. 4,511,478, Cl. 210-691.000.
Nozaki, Shigeki; Takemae, Yoshihiro; and Nakano, Tomio, to Fujitsu Limited. Semiconductor memory device. 4,511,997, Cl. 365-189.000.
Nozawa, Ryoichiro; Nagamine, Tsuyoshi; Kawamura, Hideaki; and Miyata, Mitsuto, to Fanuc Ltd. Numerical control machine tool. 4,511,975, Cl. 364-474.000.
Nozue, Ikutoshi; Fujii, Susumu; and Hanada, Masayuki, to Catalysts & Chemicals Industries Co., Ltd. Catalyst for use in hydrolysis of carbonyl sulfide. 4,511,668, Cl. 502-84.000.
NUKEM GmbH: *See—*
Sternberg, Walter; Schreyer, Fritz; and Ruth, Ursula, 4,510,811, Cl. 73-611.000.
Numata, Hideo: *See—*
Matsubara, Naoki; and Numata, Hideo, 4,511,819, Cl. 310-340.000.
Nunn, Timothy A.: *See—*
Kurtz, Anthony D.; Nunn, Timothy A.; and Mallon, Joseph R., 4,510,671, Cl. 29-571.000.
Nunokawa, Eiichi; Ishida, Toshihiko; and Ohira, Yasuo, to TDK Corporation. Hub of a tape cassette. 4,511,099, Cl. 242-71.800.

Nunokawa, Kazuo; and Masuyama, Masayuki, to Tokyo Kogaku Kikai Kabushiki Kaisha. Ophthalmic apparatus having means for automatic detection of appropriate position of eye to be examined. 4,511,227, Cl. 351-208.000.

N.V. Nederlandse Metaalindustrie Polynorm: *See*— van Wieringen, Gijsbertus L., 4,510,722, Cl. 52-213.000.

N.V. Optische Industrie "De Oude Delft" : *See*— Burgemeister, Eduard A., 4,511,783, Cl. 219-121.0LM.

N.V. Raychem S.A.: *See*— Moisson, Marc F. L., 4,511,611, Cl. 428-35.000.

Oberbach, Karl: *See*— Schauf, Dieter; Protoschill, Klaus; Oberbach, Karl; and Depcik, Hans-Werner, 4,511,184, Cl. 301-63.0PW.

Oberto, Giacomo, to Olivetti Accessori, S.p.A. Typing ribbon cartridge with blocking element. 4,511,271, Cl. 400-208.000.

Obey, James H.: *See*— Moore, James G.; Obey, James H.; and Pinkel, Edward B., 4,511,431, Cl. 159-47.100.

Occidental Chemical Corporation: *See*— Colaruotolo, Joseph F.; Irvine, Robert L.; Ketchum, Lloyd H., Jr.; and Ying, Wei-chi, 4,511,657, Cl. 435-253.000.

Occidental Refineries Ltd.: *See*— Byatt, Dennis W. G.; and Walker, John W., 4,510,804, Cl. 73-290.00V.

Ochoa, Ricardo: *See*— Lincoln, Kay L.; and Ochoa, Ricardo, 4,510,887, Cl. 119-95.000.

Oda, Keijiro: *See*— Kishida, Katsuji; Ueno, Tetsuto; Onishi, Masakazu; and Oda, Keijiro, 4,510,984, Cl. 152-362.0CS.

Odetics, Inc.: *See*— Bartholet, Stephen J., 4,511,011, Cl. 180-8.600.

Oetringhaus, Walter G., to M.A.N. Maschinenfabrik Aktiengesellschaft. Railless vechicle for underground mining. 4,511,100, Cl. 242-86.510.

Offenstadt, Eric. Wheel suspension for a motorcycle. 4,511,156, Cl. 280-276.000.

Ogawa, Akira; and Tsuda, Momotoshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,511,649, Cl. 430-553.000.

Ogawa, Hiroshi: *See*— Anonuma, Masashi; Tamai, Yasuo; Sato, Tsunehiko; Funabashi, Shinichi; and Ogawa, Hiroshi, 4,511,484, Cl. 252-62.540.

Ogawa, Takaki: *See*— Nakane, Masao; Takahashi, Motohiko; and Ogawa, Takaki, 4,511,974, Cl. 364-463.000.

Ogawa, Toshio; and Kittaka, Toshihiko, to Murata Manufacturing Co., Ltd. Piezoelectric ceramic compositions. 4,511,483, Cl. 252-62.900.

Ogden, Ralph. Barbeque grill with paper start facility. 4,510,916, Cl. 126-25.00B.

Ogez, John R.: *See*— Builder, Stuart E.; and Ogez, John R., 4,511,502, Cl. 260-112.00R.

Ogino, Toshiro; and Kokawa, Katsuzo, to Matsushita Electric Industrial Co., Ltd. Oil burner. 4,511,327, Cl. 431-201.000.

Ogiso, Makoto: *See*— Hidaka, Tsuneo; Inoue, Masahide; and Ogiso, Makoto, 4,511,336, Cl. 433-173.000.

Ohgata, Toshihide: *See*— Mizutani, Tatsumi; Ohgata, Toshihide; and Komatsu, Hideo, 4,511,429, Cl. 156-643.000.

Ohira, Takao; Okihara, Daijiro; and Niiro, Makoto, to Sony Corporation. Video tape recorder. 4,511,934, Cl. 360-55.000.

Ohira, Yasuo: *See*— Nunokawa, Eiichi; Ishida, Toshihiko; and Ohira, Yasuo, 4,511,099, Cl. 242-71.800.

Ohkoshi, Tatsuo; and Kobayashi, Chikara, to Nara Machinery Co., Ltd. Mixer-granulator drier. 4,511,093, Cl. 241-60.000.

Ohkuni, Shinichiro; and Kitazawa, Yoichi, to Bridgestone Tire Company Limited. Pair of pneumatic belted tires for motorcycle. 4,510,983, Cl. 152-361.00R.

Ohmura, Jukichi: *See*— Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,511,518, Cl. 260-543.00F.

Ohnishi, Souichi: *See*— Mochizuki, Daisuke; Ohnishi, Souichi; and Komai, Kensaku, 4,512,027, Cl. 377-16.000.

Ohsumi, Tadashi; Inoue, Satoru; and Maeda, Kiyoto, to Sumitomo Chemical Company, Limited. Fungicidal indanylbenzamide. 4,511,581, Cl. 514-617.000.

Ohta, Nobuo, to Carl Freudenberg, Firma. Method for manufacturing an adhesive interlining and fabric produced thereby. 4,511,615, Cl. 428-198.000.

Ohtsubo, Yoshiaki: *See*— Kazami, Kazuyuki; and Ohtsubo, Yoshiaki, 4,511,233, Cl. 354-418.000.

Ohyachi, Tomio: *See*— Tanuma, Itsuo; Takeichi, Hideo; Fukuura, Yukio; Ohyachi, Tomio; and Naito, Kazuo, 4,511,627, Cl. 428-429.000.

Ojanpera, Heimo K. Woven fringed textile product and a method for making said manufacturing product. 4,510,975, Cl. 139-384.00R.

Oka, Tatsushi: *See*— Morihara, Kazuyuki; Oka, Tatsushi; and Tsuzuki, Hiroshige, 4,511,505, Cl. 260-112.700.

Okada, Hitoshi: *See*— Yamaguchi, Katsumi; Takai, Kazuki; and Okada, Hitoshi, 4,511,940, Cl. 360-96.600.

Okada, Yasuyuki: *See*— Machida, Tetsuo; Tsuhara, Susumu; Tabata, Kuniaki; and Okada, Yasuyuki, 4,511,962, Cl. 364-200.000.

Okamoto, Yoshio: *See*— Yuki, Heimei; and Okamoto, Yoshio, 4,511,475, Cl. 210-635.000.

Okamoto, Yoshiyuki; and Hwang, Edward F., to W. R. Grace & Co. Poly(dipropargylamine) and derivatives thereof per se and p-doped and processes for preparing same. 4,511,702, Cl. 526-90.000.

Okamura, Hisashi; Sakaguchi, Shinji; Takahashi, Osamu; and Murai, Ashita, to Fuji Photo Film Co., Ltd. Photographic elements with development inhibitor precursor. 4,511,644, Cl. 430-219.000.

Okamura, Yoshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Door latch assembly for microwave heating apparatus. 4,511,780, Cl. 219-10.55C.

Okano, Takashi, to Universal Pioneer Corporation. Information reproducing apparatus in a recording disc player. 4,512,005, Cl. 369-48.000.

Okano, Yoshio; and Okuma, Yasuo, to Hitachi, Ltd. Portable terminal device. 4,511,970, Cl. 364-401.000.

Okawa, Masao, to Sumitomo Heavy Industries, Ltd. Apparatus for transferring articles. 4,511,029, Cl. 198-621.000.

Okazaki, Michio, to Diesel Kiki Co., Ltd. Method for manufacturing a vane compressor having a lightweight rotor. 4,510,659, Cl. 29-156.80R.

Okazaki, Yutaka: *See*— Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,511,574, Cl. 514-371.000.

Okihara, Daijiro: *See*— Ohira, Takao; Okihara, Daijiro; and Niiro, Makoto, 4,511,934, Cl. 360-55.000.

Oklahoma Agriculture and Mechanical Colleges Acting for and in Behalf of Oklahoma State University, Board of Regents for the: *See*— Whitcomb, Carl E., 4,510,712, Cl. 47-66.000.

Okui, Isamu: *See*— Yoshihisa, Kozo; and Okui, Isamu, 4,511,849, Cl. 329-103.000.

Okuma, Yasuo: *See*— Okano, Yoshio; and Okuma, Yasuo, 4,511,970, Cl. 364-401.000.

Okuna, Kenzi: *See*— Takahashi, Kazue; Okuna, Kenzi; Nakajima, Isao; Harada, Mineo; and Kako, Yutaka, 4,511,269, Cl. 400-124.000.

Olin Corporation: *See*— Shapiro, Eugene; and Mandigo, Frank N., 4,511,410, Cl. 148-13.200.

Olivetti Accessori, S.p.A.: *See*— Oberto, Giacomo, 4,511,271, Cl. 400-208.000.

Olmsted, Robert W.; and Huth, Joseph F., III, to Spang Industries Inc. Inductance tuning means and methods of manufacture. 4,511,872, Cl. 336-83.000.

Olsen, Arthur A., to Ball Corporation. Apparatus for measuring scalar irradiance. 4,511,250, Cl. 356-225.000.

Olsen, William A. Golf swing training club. 4,511,147, Cl. 273-193.00A.

Olson, John T., to Economics Laboratory, Inc. Fluid system control apparatus and method. 4,511,311, Cl. 417-5.000.

Olson, Kenneth C.; and Pai, Rong-Chang, to Genentech, Inc. Purification and activity assurance of precipitated heterologous proteins. 4,511,503, Cl. 260-112.00R.

Olson, Sharon; and Zoss, Robert, to General Mills, Inc. Fried foods of reduced oil absorption and methods of preparation employing spray of film forming agent. 4,511,583, Cl. 426-89.000.

Olsson, Stefan; and Widenback, Ralph, to Unifos Kemi AB. Process for blowing film from linear thermoplastic material. 4,511,530, Cl. 264-564.000.

Olszewski, Douglas J.: *See*— Sabatino, Anthony; Schaumburg, Edward G.; Recht, Peter A.; Olszewski, Douglas J.; and Strait, Richard T., 4,510,682, Cl. 29-623.100.

Olympia Werke AG: *See*— Pokorny, Cornel; and Brendes, Horst, 4,511,267, Cl. 400-110.000.

Olympus Optical Company Limited: *See*— Imai, Yougo; and Takenaga, Hideo, 4,511,935, Cl. 360-66.000.

Omaha Door Company: *See*— Friesz, Robert E., 4,510,663, Cl. 29-429.000.

Omori, Norio: *See*— Ninomiya, Masakazu; Suda, Toshi; Omori, Norio; Akiyama, Susumu; and Fukaya, Hiroyasu, 4,510,910, Cl. 123-486.000.

Omori, Shogo. Duster-polisher made of plastic film. 4,510,640, Cl. 15-104.00A.

Omron Tateisi Electronics Co.: *See*— Imamichi, Tutomu, 4,511,794, Cl. 235-379.000.

Omura, Takashi: *See*— Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, 4,511,507, Cl. 534-629.000.

O'Neill, William B. Self-loading and unloading vehicle. 4,511,303, Cl. 414-458.000.

Onishi, Masakazu: *See*— Kishida, Katsuji; Ueno, Tetsuto; Onishi, Masakazu; and Oda, Keijiro, 4,510,984, Cl. 152-362.0CS.

Ono, Takashi: *See*— Miura, Kunio; and Ono, Takashi, 4,511,973, Cl. 364-449.000.

Ooba, Yuji: *See*— Higashi, Kensaku; Yano, Haruhiko; Sato, Hirotsugu; Sukegawa, Ken; and Ooba, Yuji, 4,511,642, Cl. 430-161.000.

Oono, Masaji: *See*— Umezawa, Hamao; Oono, Masaji; Ishihama, Hiroshi; Kyotani, Yoshinori; and Takahashi, Yoshio, 4,511,509, Cl. 260-239.00A.

Opitz, Norbert: *See*—
Lubbers, Dietrich W.; and Opitz, Norbert, 4,511,660, Cl. 436-163.000.
Opsahl, Allan W.: *See*—
Kasper, James R.; and Opsahl, Allan W., 4,510,714, Cl. 49-249.000.
Orchard, Rolf O., to Puritan Bennett Corp. Tube securing mechanism. 4,511,164, Cl. 285-252.000.
Organisme Autonome Dote de la Personnalite Civile Agence France Presse: *See*—
Dureigne, Bernard; Guerillot, Stephane; and Regnault, Alain, 4,511,992, Cl. 364-825.000.
Orio, Alfred P.; Levy, Leonard R.; and Gulla, Michael, to Shipley Company Inc. Immersion tin composition and process for using. 4,511,403, Cl. 106-1.220.
Oronzio de Nora Impianti Elettrochimici S.p.A.: *See*—
Pellegri, Alberto, 4,511,442, Cl. 204-98.000.
Orr Felt Company, The: *See*—
Shah, Shirish M., 4,511,361, Cl. 8-471.000.
Ors, Jose A.; and Small, Richard D., Jr., to AT&T Technologies, Inc. Circuit board fabrication leading to increased capacity. 4,511,757, Cl. 174-68.500.
Osaka Soda Co. Ltd.: *See*—
Matoba, Yasuo; and Ishimori, Isao, 4,511,698, Cl. 525-187.000.
Osaki, Takayoshi: *See*—
Ninagawa, Yoichi; Yamada, Osamu; Renge, Tsumoru; Kyo, Sunao; Osaki, Takayoshi; and Kushida, Koichi, 4,511,751, Cl. 585-608.000.
Osecky, Benjamin D.: *See*—
Georg, Dennis D.; and Osecky, Benjamin D., 4,511,964, Cl. 364-200.000.
Osgood, R. W. Mini-bidet. 4,510,630, Cl. 4-443.000.
Ostertag, Klaus: *See*—
Ross, Dieter; and Ostertag, Klaus, 4,511,803, Cl. 250-563.000.
Ostrobrod, Meyer. Safety device. 4,511,123, Cl. 254-364.000.
O'Sullivan, Daniel J. Convenient baby chair. 4,511,177, Cl. 297-136.000.
Otake, Katsumasa: *See*—
Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, 4,511,507, Cl. 534-629.000.
Otobe, Yutaka, to Honda Giken Kogyo Kabushiki Kaisha. Method for controlling fuel supply to an internal combustion engine after termination of fuel cut. 4,510,911, Cl. 123-493.000.
Otsuki, Zenju: *See*—
Inami, Mamoru; Tanaka, Yoshiaki; and Otsuki, Zenju, 4,510,840, Cl. 84-477.00R.
Ott, Karl-Heinz: *See*—
Lindner, Christian; Braese, Hans-Eberhard; Ott, Karl-Heinz; and Uerdingen, Walter, 4,511,695, Cl. 525-80.000.
Otte, Dieter W.: *See*—
Sarnosky, Joseph R.; Wolbrink, David W.; and Otte, Dieter W., 4,510,851, Cl. 98-42.080.
Otterbacher, Eric W.: *See*—
Mendoza, Abel; and Otterbacher, Eric W., 4,511,731, Cl. 560-061.000.
Oude Alink, Bernardus A.: *See*—
Outlaw, Benjamin T.; Oude Alink, Bernardus A.; Kelley, Joe A.; and Claywell, Carol S., 4,511,480, Cl. 252-8.55E.
Outlaw, Benjamin T.; Oude Alink, Bernardus A.; Kelley, Joe A.; and Claywell, Carol S., to Petrolite Corporation. Corrosion inhibition in deep gas wells by phosphate esters of poly-oxyalkylated thiols. 4,511,480, Cl. 252-8.55E.
Oval Engineering Co., Ltd.: *See*—
Matsubara, Naoki; and Numata, Hideo, 4,511,819, Cl. 310-340.000.
Overaker, Ronald F.: *See*—
Jobsis, Frans F.; Keizer, Hans H.; and Overaker, Ronald F., 4,510,938, Cl. 128-633.000.
Overholser, Duane J.; and Prough, Craig M. Combined batters' and catcher's box marking frame. 4,510,692, Cl. 33-174.00G.
Overmier, David K., to United States of America, Energy. Method of measuring material properties of rock in the wall of a borehole. 4,510,799, Cl. 73-151.000.
Owen, Hartley: *See*—
Wright, Bernard S.; Hsia, Chung H.; and Owen, Hartley, 4,511,747, Cl. 585-415.000.
Owens, Burgess. Drinking cup holder for automobiles. 4,511,072, Cl. 224-273.000.
Owens-Corning Fiberglas Corporation: *See*—
Bhatti, Mohinder S., 4,511,383, Cl. 65-6.000.
Desai, Avinash J.; and Kreikebaum, Gerhard, 4,511,791, Cl. 219-497.000.
Owens-Illinois, Inc.: *See*—
Barkhau, Marvin L.; and Kujawa, Joseph J., 4,511,385, Cl. 65-135.000.
Desai, Kirit C., 4,511,051, Cl. 215-225.000.
Oye, Kevin J.: *See*—
Koenig, Mark J.; and Oye, Kevin J., 4,511,969, Cl. 364-200.000.
Ozaki, Syunzaburo: *See*—
Yatabe, Fumio; and Ozaki, Syunzaburo, 4,510,901, Cl. 123-325.000.
Ozawa, Mikio: *See*—
Miyamori, Hideaki; Takagi, Kenji; Sato, Shigeru; Takahashi, Fujio; and Ozawa, Mikio, 4,511,784, Cl. 219-123.000.
Ozawa, Takashi, to Fuji Xerox Co., Ltd. Noise reduction apparatus for hybrid image sensor. 4,511,804, Cl. 250-578.000.
Ozawa, Toshiaki: *See*—
Yamada, Yasuaki; Ozawa, Toshiaki; and Kondo, Hiroatsu, 4,511,830, Cl. 318-318.000.
Ozeki, Takeshi; and Tamura, Toshifumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical communication system. 4,511,208, Cl. 350-96.160.
P.J. Industrial Safety Elec. Co. Ltd.: *See*—
Jansen, Friedrich W., 4,511,786, Cl. 219-364.000.
Packaging Corporation of America: *See*—
Madsen, Roger E.; and Williams, Michael M., 4,511,080, Cl. 229-41.00C.
Padly, Yvan; and Borgeaud, Roger, to Societe d'Assistance Technique pour Produits Nestle S.A. Pasteurization of eggs. 4,511,589, Cl. 426-521.000.
Pai, Rong-Chang: *See*—
Olson, Kenneth C.; and Pai, Rong-Chang, 4,511,503, Cl. 260-112.00R.
Palensky, Frederick J.; and Siedle, Allen R., to Minnesota Mining and Manufacturing Company. Platinum-nitrogen complex catalysts. 4,511,715, Cl. 544-225.000.
Pallos, Laszlo : *See*—
Benko, Pal; Ratz nee Simonek, Ildiko ; Pallos, Laszlo ; Magyar, Karoly; Kovacs, Jeno ; Matrai, Erzsebet; Gundel, Janos; and Balogh, Albert, 4,511,717, Cl. 544-353.000.
Palmer, Patrick V.: *See*—
Mannion, Geoffrey; and Palmer, Patrick V., 4,511,401, Cl. 75-130.00R.
Pan, Jing-Jong, to Harris Corporation. Dual-gate MESFET combiner/-divider for use in adaptive system applications. 4,511,813, Cl. 307-501.000.
Pan, You-Chwen. Computer diskette cases. 4,511,034, Cl. 206-310.000.
Panhandle Eastern Pipe Line Company: *See*—
Tietze, Thomas N., 4,511,844, Cl. 324-425.000.
Park, George; Smith, Michael J.; and Carrington, Harry, to U.S. Philips Corporation. Magazine and disc holders for supporting discs in the magazine. 4,511,194, Cl. 312-12.000.
Park-Ohio Industries, Inc.: *See*—
Dewan, Shashi B.; and Adams, Graham R., 4,511,956, Cl. 363-49.000.
Parry, James L. Drafting equipment holder. 4,510,872, Cl. 108-25.000.
Parsons, William, Jr., to Garlock, Inc. Plug valve with floating stem seal. 4,510,966, Cl. 137-375.000.
Pasquier, Rene . Improved quartz watch having a semi-rigid watch case bottom and a time setting system using an electrical contact. 4,511,260, Cl. 368-69.000.
Patel, Bakulesh B., to Motorola, Inc. Mounting arrangement for altering a microphone's frequency response. 4,511,768, Cl. 179-146.00R.
Patelhold Patentverwertungs- & Elektro-Holding AG: *See*—
Funk, Gerhard, 4,511,958, Cl. 364-200.000.
Pathfinders Group, The: *See*—
Miller, Charles H., 4,511,406, Cl. 106-18.140.
Pathway Bellows, Inc.: *See*—
Broyles, Robert K., 4,511,162, Cl. 285-93.000.
Patoflex Corporation: *See*—
Ehrlich, Johann, Jr., 4,510,702, Cl. 36-86.000.
Payne, Richard S.: *See*—
Tuttle, Ralph C.; and Payne, Richard S., 4,511,413, Cl. 148-187.000.
Pearce, Richard A., to Robbins & Myers, Inc. Ceiling fan blade isolation. 4,511,310, Cl. 416-134.00R.
Pechiney Ugine Kuhlmann: *See*—
Crussard, Charles; Maurel, Pierre; and Bonhomme, Jean, 4,511,540, Cl. 423-26.000.
Peck, Alan M., to USM Corporation. System for processing workpieces for sewing. 4,510,875, Cl. 112-121.120.
Pedersen, Karsten; Rostrup-Nielsen, Jens R.; and Jorgensen, Ib Greve H., to Haldor Topsoe A/S. Process and catalyst for the preparation of a gas mixture having a high content of C_2-hydrocarbons. 4,511,674, Cl. 518-714.000.
Peiffer, Dennis G.; Lundberg, Robert D.; and Walker, Thad O., to Exxon Research and Engineering Co. Fluid loss additive for well drilling. 4,510,998, Cl. 166-295.000.
Pellegri, Alberto, to Oronzio de Nora Impianti Elettrochimici S.p.A. Anode for electrolytic processes. 4,511,442, Cl. 204-98.000.
Pellerin, Jean-Francois G. A.: *See*—
Boy-Marcotte, Jean-Louis; Dahan, Gilbert M. I.; Dancette, Michel; Le Nabour, Marcel P.; Pellerin, Jean-Francois G. A.; Rivallin, Jose ; and Jannot, Marcel A. J., 4,511,805, Cl. 290-2.000.
Pellerin, Lucien: *See*—
Sahakian, Diran R.; Pellerin, Lucien; and Nijboer, Sjoerd, 4,511,769, Cl. 200-6.00A.
Penetone Corporation: *See*—
Matta, Grant B., 4,511,488, Cl. 252-162.000.
Pennewiss, Horst: *See*—
Kramer, Dieter; Pennewiss, Horst; Plainer, Hermann; Schnee, Reiner; and Schleier, Waldemar, 4,511,694, Cl. 525-54.100.
Penton, Perry W., to NCR Corporation. Apparatus for measuring program execution. 4,511,961, Cl. 364-200.000.
Perara, Thomas E., to Allied Corporation. Flight recorder having capability of storing intermediate data. 4,510,803, Cl. 73-178.00R.
Percel, Phillip J.; and Perkins, Douglas W., to SCM Corporation. Particulate food acidulant. 4,511,584, Cl. 426-99.000.
Percel, Phillip J.; Perkins, Douglas W.; and Petricca, Anthony V., to SCM Corporation. Preparation of acidulated meat emulsions. 4,511,592, Cl. 426-646.000.
Pereman, Gordon F.: *See*—
Kellar, John D.; and Pereman, Gordon F., 4,511,386, Cl. 65-273.000.
Kellar, John D.; and Pereman, Gordon F., 4,511,387, Cl. 65-287.000.

Periana-Pillai, Roy A.: *See*—
Bergman, Robert G.; Janowicz, Andrew H.; and Periana-Pillai, Roy A., 4,511,745, Cl. 570-241.000.
Peries, Jean-Pierre: *See*—
Billon, Alain; Jacquin, Yves; Peries, Jean-Pierre; and Toulhoat, Herve , 4,511,458, Cl. 208-59.000.
Perkins, Douglas W.: *See*—
Percel, Phillip J.; and Perkins, Douglas W., 4,511,584, Cl. 426-99.000.
Percel, Phillip J.; Perkins, Douglas W.; and Petricca, Anthony V., 4,511,592, Cl. 426-646.000.
Peroux, Bernard; Santy, Jean; and Sutter, Jean, to Pont-A-Mousson S.A. Elastomer coated butterfly valve body. 4,510,965, Cl. 137-375.000.
Perron, Robert: *See*—
Gauthier-Lafaye, Jean; Perron, Robert; and Doussain, Claude, 4,511,517, Cl. 260-549.000.
Perrot, Alexander: *See*—
Schanz, Friedrich; Schucker, Emil; Schucker, Eberhard; and Perrot, Alexander, 4,511,085, Cl. 239-242.000.
Perrot-Regnerbau GmbH & Co.: *See*—
Schanz, Friedrich; Schucker, Emil; Schucker, Eberhard; and Perrot, Alexander, 4,511,085, Cl. 239-242.000.
Peters, Edward L.: *See*—
Kolodesh, Michael S.; Peters, Edward L.; and Madgett, Raymond J., 4,511,318, Cl. 425-133.100.
Peters, Edward N.: *See*—
Fox, Daniel W.; Peters, Edward N.; and Smith, Gary F., 4,511,693, Cl. 525-67.000.
Peters, Rex B., to Sundstrand Data Control, Inc. Angular rate sensor utilizing two vibrating accelerometers secured to a parallelogram linkage. 4,510,802, Cl. 73-505.000.
Peters, Rick E. Ankle brace. 4,510,927, Cl. 128-80.00H.
Petersen, Lee B. Wheelchair restraint. 4,511,171, Cl. 296-65.00R.
Peterson, Gerald E.: *See*—
Karliner, Rudy R.; and Peterson, Gerald E., 4,511,427, Cl. 156-523.000.
Peterson, LuVerne R., to Burroughs Corporation. Detector-dummy detector combination which is integrated as a single element of reduced size. 4,511,995, Cl. 365-8.000.
Petricca, Anthony V.: *See*—
Percel, Phillip J.; Perkins, Douglas W.; and Petricca, Anthony V., 4,511,592, Cl. 426-646.000.
Petrolite Corporation: *See*—
Outlaw, Benjamin T.; Oude Alink, Bernardus A.; Kelley, Joe A.; and Claywell, Carol S., 4,511,480, Cl. 252-8.55E.
Robinson, James R., 4,511,452, Cl. 204-302.000.
Pfizer Inc.: *See*—
Holland, Gerald F., 4,511,575, Cl. 514-423.000.
Holland, Gerald F., 4,511,576, Cl. 514-423.000.
Pharmasol Corporation, The: *See*—
Kalat, Edwin F., 4,511,069, Cl. 222-263.000.
Phelps, Andrew E.; and Ta-Ming Wu, Allen, to Burroughs Corporation. Shifter circuit. 4,512,018, Cl. 370-112.000.
Phelps, Frankie E.; Boget, Paul J.; and Troup, Robert L., to Aluminum Company of America. Process for producing beta'-silicon aluminum oxynitride (B'-SiAlON). 4,511,666, Cl. 501-98.000.
Philip Morris Incorporated: *See*—
Keritsis, Gus D.; and Nichols, Walter A., 4,510,950, Cl. 131-353.000.
Philipp, Clemens: *See*—
Artz, Gerd; Figge, Dieter; and Philipp, Clemens, 4,510,990, Cl. 164-431.000.
Phillips, Edward H., to Amfit Incorporated. System and method for forming custom-made shoe inserts. 4,510,636, Cl. 12-1.00R.
Phillips Petroleum Company: *See*—
Arnim, Robert C., II; and Bourne, Gregory D., 4,510,985, Cl. 175-7.000.
Horton, Robert L.; and Stahl, G. Allan, 4,511,677, Cl. 521-28.000.
Phillips, Robert F.: *See*—
McIntyre, James A.; and Phillips, Robert F., 4,511,441, Cl. 204-98.000.
Pickering, William: *See*—
Melocik, Grant C.; and Pickering, William, 4,511,947, Cl. 361-191.000.
Pierart, Robert, to Ateliers et Chantiers de Bretagne, A C B. Device for supporting and protecting nuclear boilers. 4,511,532, Cl. 376-461.000.
Pierburg GmbH & Co., KG: *See*—
Ballik, Rainer; and Hutten, Heinrich, 4,511,082, Cl. 239-8.000.
Pierre Fabre S.A.: *See*—
Pitet, Guy; Cousse, Henri; and Mouzin, Gilbert, 4,511,566, Cl. 514-242.000.
Pilkington Brothers P.L.C.: *See*—
Evason, John; Rigby, Malcolm J.; and Ward, Peter, 4,511,384, Cl. 65-114.000.
Pillsbury Company, The: *See*—
Durst, Jack R., 4,511,585, Cl. 426-106.000.
Pinet, Philippe: *See*—
Curinier, Jean; and Pinet, Philippe, 4,510,657, Cl. 28-100.000.
Pinkel, Edward B.: *See*—
Moore, James G.; Obey, James H.; and Pinkel, Edward B., 4,511,431, Cl. 159-47.100.
Pinter, Joseph: *See*—
Alt, Richard C.; and Pinter, Joseph, 4,510,862, Cl. 101-93.140.
Pinto, Akiva: *See*—
Keller, Alex J.; and Pinto, Akiva, 4,510,647, Cl. 19-105.000.
Pitet, Guy; Cousse, Henri; and Mouzin, Gilbert, to Pierre Fabre S.A. 2-N-Cycloalkylmethyl 3-oxo 5,6-diaryl-as-triazines. 4,511,566, Cl. 514-242.000.
Pitts, Warren R.; and Salit, Herbert W., to Dennison Mfg. Company. Anticounterfeit magnetic metallized labels. 4,511,616, Cl. 428-203.000.
Plainer, Hermann: *See*—
Kramer, Dieter; Pennewiss, Horst; Plainer, Hermann; Schnee, Reiner; and Schleier, Waldemar, 4,511,694, Cl. 525-54.100.
Plastech International, Inc.: *See*—
Daloisio, Pasquale C., 4,511,154, Cl. 280-47.260.
Play, Dominique; Bonneau, Marc; Merieux, Charles; Herbage, Daniel; and Comte, Philippe, to Foundation Merieux; and Centre Technique du Cuir. Process for the industrial preparation of collagenous materials from human placental tissues, human collagenous materials obtained and their application as biomaterials. 4,511,653, Cl. 435-69.000.
Plettner, Horst: *See*—
Korner, Gerhard; Plettner, Horst; Viering, Walter; and Rees, Volker, 4,511,775, Cl. 200-148.00A.
PLM Aktiebolag: *See*—
Jakobsen, Kjell M.; and Nilsson, Clees T., 4,511,322, Cl. 425-384.000.
Ploegaert, Hendrikus T.; Molenaar, Ronald N.; and Butter, Johannes A. M., to Hoogovens Groep B.V. Method of monitoring the wear of a refractory lining of a metallurgical furnace wall. 4,510,793, Cl. 73-86.000.
Poel, Hendrik: *See*—
Groothuis, Gerrit J.; de Haan, Atze; Poel, Hendrik; Tietjens, Eduard W.; and de Vries, Jochem J., 4,510,687, Cl. 30-34.200.
Pohlenz, Elmer E.: *See*—
LaBarge, Robert L.; Horansky, Frank J.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,510,857, Cl. 100-53.000.
LaBarge, Robert L.; Pohlenz, Elmer E.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Scherf, Thomas W., 4,510,860, Cl. 100-49.000.
Pohlig, Dietmar; and Goepel, Ernst, to Siemens Aktiengesellschaft. Circuit arrangement for positioning the printing mechanisms in printers employing a d.c. motor. 4,511,797, Cl. 250-231.0SE.
Pointner, Norbert: *See*—
Binz, Reiner; and Pointner, Norbert, 4,512,014, Cl. 370-84.000.
Pokorny, Cornel; and Brendes, Horst, to Olympia Werke AG. Method for changing the supply of characters in an ideographic typewriter by combining and storing individual characters. 4,511,267, Cl. 400-110.000.
Pokrinchak, Jordan J., to Bar-Ray Products, Inc. Viewer for X-ray and like films. 4,510,708, Cl. 40-361.000.
Polinsky, Samuel M.: *See*—
Bierman, Laurence W.; Polinsky, Samuel M.; Hempel, David A.; and Humberger, Roger B., 4,511,541, Cl. 423-100.000.
Polyplastics Company, Ltd.: *See*—
Kasuga, Takuzo; Takahashi, Katsuhiko; and Suzuki, Kunio, 4,511,708, Cl. 528-274.000.
Pompei, Michel: *See*—
Bernuchon, Marc; Pompei, Michel; and Gregoire, Daniel, 4,511,126, Cl. 267-140.100.
Pont-A-Mousson S.A.: *See*—
Peroux, Bernard; Santy, Jean; and Sutter, Jean, 4,510,965, Cl. 137-375.000.
Ponzellini, Giulio, to Castelli S.p.A. Locking device for the assembling of modular elements of pieces of furniture. 4,511,108, Cl. 248-188.700.
Pook, Roger: *See*—
Washington, Derek; and Pook, Roger, 4,511,822, Cl. 313-400.000.
Porges, Stephen W. Method and apparatus for evaluating rhythmic oscillations in aperiodic physiological response systems. 4,510,944, Cl. 128-687.000.
Porter, Randall A.: *See*—
Reed, Larry E.; Porter, Randall A.; Farha, Floyd E., Jr.; and Guillory, Jack P., 4,511,405, Cl. 106-15.050.
Post, Willem P., to Thomassen & Drijver-Verblifa N.V. Apparatus for cutting through or trimming a pipe or can in a plane transverse to its longitudinal axis. 4,510,830, Cl. 83-114.000.
Pote, Robert L., Jr., to Tempo, Inc. Golf training device. 4,511,142, Cl. 273-87.400.
Poteat, Vance E.: *See*—
Fulcomer, Emanuel J., Jr.; Nici, Richard J.; Poteat, Vance E.; Schramm, George W.; Sharp, John B.; and Winseck, Michael M., Jr., 4,512,016, Cl. 370-110.100.
PPG Industries, Inc.: *See*—
Kellar, John D.; and Pereman, Gordon F., 4,511,386, Cl. 65-273.000.
Kellar, John D.; and Pereman, Gordon F., 4,511,387, Cl. 65-287.000.
Valko, Joseph T., 4,511,447, Cl. 204-181.00C.
Prato, Pietro, to Minnesota Mining and Manufacturing Company. Coating apparatus and method for the curtain coating of liquid compositions using it. 4,510,882, Cl. 118-300.000.
Prellwitz, Hubert, to VEB Kombinat Fortschritt Landmaschinen. Baler knotting device with complementary knotter and stripper. 4,511,165, Cl. 289-8.000.
Prescolite, a division of U.S. Industries: *See*—
Druffel, James B.; and Cohen, Joel S., 4,511,113, Cl. 248-546.000.
Presley, Glen T.; and Lautzenhiser, Lloyd L., to Electro-Hydraulic Controls, Inc. Proportional-flow electrohydraulic control. 4,510,963, Cl. 137-117.000.

Prestele, Karl: *See—*
Franetzki, Manfred; and Prestele, Karl, 4,511,355, Cl. 604-131.000.
Preston, Edward G.; and Stewart, David B., to Molins, PLC. Feeding particulate material, especially tobacco. 4,510,949, Cl. 131-109.00R.
Prete, Ernest, Jr.; and Knox, Howard, to Ancra Corporation. Ratchet buckle with a removable operating lever. 4,510,651, Cl. 24-68.00R.
Prince Corporation: *See—*
Marcus, Konrad H.; and Cody, Michael J., 4,511,954, Cl. 362-275.000.
Pringle, Ronald E., to Camco, Incorporated. Pump out sub. 4,510,994, Cl. 166-156.000.
Prinz, Eckhard: *See—*
Kuhlmann, Heinz; and Prinz, Eckhard, 4,511,419, Cl. 156-272.600.
Prior, Maurice, to Mobil Oil Corporation. Drilling mud testing system having a thermally isolated pump. 4,510,800, Cl. 73-153.000.
Pritzwald-Stegmann, Bernd: *See—*
Boesig, Werner; and Pritzwald-Stegmann, Bernd, 4,511,553, Cl. 424-35.000.
Procter & Gamble Company, The: *See—*
Kolodesh, Michael S.; Peters, Edward L.; and Madgett, Raymond J., 4,511,318, Cl. 425-133.100.
Prosen, Edward J. Bomb-type conduction calorimeter. 4,511,263, Cl. 374-38.000.
Protin, Bernard: *See—*
Nassoy, Jacques; and Protin, Bernard, 4,510,667, Cl. 29-526.00R.
Protoschill, Klaus: *See—*
Schauf, Dieter; Protoschill, Klaus; Oberbach, Karl; and Depcik, Hans-Werner, 4,511,184, Cl. 301-63.0PW.
Prough, Craig M.: *See—*
Overholser, Duane J.; and Prough, Craig M., 4,510,692, Cl. 33-174.00G.
Pruhs, Horst; and Altenschopfer, Theodor, to Henkel Kommanditgesellschaft auf Aktien. Dishwasher detergent paste. 4,511,487, Cl. 252-99.000.
Prussin, Simon A.; and Hikin, Boris L., to TRW Inc. Shallow junction depth measurement method. 4,510,798, Cl. 73-150.00R.
PTC Aerospace Inc.: *See—*
Brennan, Edward J., 4,511,178, Cl. 297-146.000.
Purcell, Robert H.; and Feinstone, Stephen M., to United States of America, Health and Human Services. Inactivation of a lipid virus. 4,511,556, Cl. 514-743.000.
Purdue Research Foundation: *See—*
Gong, Cheng-Shung, 4,511,656, Cl. 435-161.000.
Purdy, Paul J. Manlift. 4,511,015, Cl. 182-2.000.
Puritan Bennett Corp.: *See—*
Orchard, Rolf O., 4,511,164, Cl. 285-252.000.
Purser, Ben D. Apparatus and method for preparing a mixture of combustible liquid fuel and air. 4,510,914, Cl. 123-590.000.
Putz, Peter: *See—*
Kuhnel, Werner; Putz, Peter; Simm, Manfred; and Spielau, Paul, 4,511,619, Cl. 428-215.000.
Quarles, James H. Ice making machine with reverse direction hot gas thawing and pressurized gas discharge. 4,510,761, Cl. 62-73.000.
Quates, Norman C., Jr.: *See—*
Quates, Norman C., Sr; and Quates, Norman C., Jr., 4,511,291, Cl. 406-128.000.
Quates, Norman C., Sr; and Quates, Norman C., Jr. Vacuum material conveying apparatus. 4,511,291, Cl. 406-128.000.
Quay, Earl R.; and Tilson, Alan L., to Mayer, Rothkopf Industries, Inc. Fiber transfer system for sliver high pile fabric circular knitting machines. 4,510,773, Cl. 66-9.00B.
Quenneville, Raymond N., to Jacobs Manufacturing Company, The. Hydraulic pulse engine retarder. 4,510,900, Cl. 123-321.000.
Quigley, M. Scott; and Russell, Gordon A., to Mobil Oil Corporation. Controlled heater for drilling mud testing system. 4,510,801, Cl. 73-153.000.
R. A. Jones & Co. Inc.: *See—*
Hughes, Charles C., 4,511,134, Cl. 271-113.000.
Rabatin, Robert U. Sound suppressor attaching device for guns. 4,510,843, Cl. 89-14.400.
Racanelli, Sylvester. Mail metering process and machine. 4,511,793, Cl. 235-375.000.
Rachui, Roy A.: *See—*
Huerta, Jose L.; Rachui, Roy A.; Roberts, James E.; and Simpson, Grainger I., Jr., 4,511,135, Cl. 271-126.000.
Radionics, Inc.: *See—*
Fiore, Louis T., 4,511,887, Cl. 340-539.000.
Rahnke, Christian J., to Ford Motor Company. Turbocharger and exhaust gas control therefor. 4,510,754, Cl. 60-602.000.
Rajaram, Babu, to Zenith Electronics Corporation. Video ram accessing system. 4,511,965, Cl. 364-200.000.
Rakosi, Miklos: *See—*
Mogyorodi, Ferenc; Koppany, Eniko; Bodi, Tibor; Balogh, Karoly; Toth, Istvan; Bognar, Rezso; Makleit, Sandor; Litkei, Gyorgy; Rakosi, Miklos; and Dinya, Zoltan, 4,511,736, Cl. 564-214.000.
Ramge, Dennis L.; and Miller, John H., to Manville Service Corporation. Apparatus for the reclamation of glass fiber from scrap fiber glass mat. 4,511,328, Cl. 432-59.000.
Ramuz, Henri, to Hoffmann-La Roche Inc. 2-Imino-imidazolidine derivatives. 4,511,720, Cl. 546-273.000.
Ranco Incorporated: *See—*
Rossi, Guglielmo, 4,510,765, Cl. 62-154.000.
Randall, Lowell N. Sprinkler. 4,511,003, Cl. 169-38.000.
Rangaire Corporation: *See—*
Tucker, Raymond M.; and Dyer, Clarence L., 4,511,781, Cl. 219-10.770.
Rantala, Borje, to Instrumentarium Oy. Filter assembly for eliminating mains disturbances. 4,511,847, Cl. 328-167.000.
Rasmussen, John F.; and Gaia, Aldino J., to McGraw-Edison Company. Fatigue-resistant fuse strip. 4,511,874, Cl. 337-159.000.
Raso, Roland: *See—*
Nicolas, Jacques; and Raso, Roland, 4,510,869, Cl. 102-240.000.
Ratnik Industries, Inc.: *See—*
Muller-Girard, Otto, 4,511,083, Cl. 239-14.000.
Ratz, Gerhard, to Rodi & Wienenberger. Flexible band. 4,510,746, Cl. 59-79.100.
Ratz nee Simonek, Ildiko : *See—*
Benko, Pal; Ratz nee Simonek, Ildiko ; Pallos, Laszlo ; Magyar, Karoly; Kovacs, Jeno ; Matrai, Erzsebet; Gundel, Janos; and Balogh, Albert, 4,511,717, Cl. 344-353.000.
Rau, Karl, to VDO Adolf Schindling AG. Suction device. 4,510,968, Cl. 137-590.000.
Rau, Rama N.: *See—*
Moran, James H.; and Rau, Rama N., 4,511,842, Cl. 324-338.000.
Rauneker, Josef, to Daimler-Benz Aktiengesellschaft. Drive axle for a motor vehicle. 4,511,012, Cl. 180-65.200.
Rauser, Jan A. I.; and Cetrelli, Renato, to Tetra Pak International AB. Packing container with a crack-resistant laminate. 4,511,078, Cl. 229-17.00R.
Ravindram, Maddury; and Kalvinskas, John J., to United States of America, National Aeronautics and Space Administration. Fluidized bed desulfurization. 4,511,362, Cl. 44-1.0SR.
Ravizza S.p.A.: *See—*
Mauri, Francesco, 4,511,510, Cl. 260-239.30D.
Ravn, Jacob: *See—*
Connor, John T.; Halsted, Charles P.; and Ravn, Jacob, 4,511,044, Cl. 209-522.000.
Raybuck, William B., to Trimmer Machine Co., Inc. Method and apparatus for aligning and trimming overlapped signatures. 4,511,131, Cl. 270-54.000.
Raychem Corporation: *See—*
Flot, Regis; and Hine, Jean Patrick, 4,510,827, Cl. 81-9.400.
Raymond Kaiser Engineers Inc.: *See—*
Bucha, Robert M.; Dzermejko, Albert J.; and Stuart, James G., 4,511,264, Cl. 374-135.000.
Gidick, Ward F., 4,510,959, Cl. 137-15.000.
Razdobreev, Vadim. Pneumatic collet release tool. 4,511,295, Cl. 409-233.000.
RCA Corporation: *See—*
Griffis, Patrick D.; and Rindal, Abraham E., 4,511,924, Cl. 358-197.000.
Harbeke, Gunther; and Duffy, Michael T., 4,511,800, Cl. 250-372.000.
Harlan, Wayne E.; and Marsh, James C., Jr., 4,511,921, Cl. 358-161.000.
Lewis, Henry G., Jr., 4,511,922, Cl. 358-166.000.
Schier, John H., Jr.; and Brooks, William E., Jr., 4,511,871, Cl. 335-213.000.
Recht, Peter A.: *See—*
Sabatino, Anthony; Schaumburg, Edward G.; Recht, Peter A.; Olszewski, Douglas J.; and Strait, Richard T., 4,510,682, Cl. 29-623.100.
Reed, Larry E.; Porter, Randall A.; Farha, Floyd E., Jr.; and Guillory, Jack P. Antifoulants for thermal cracking processes. 4,511,405, Cl. 106-15.050.
Rees, Richard W. A., to General Motors Corporation. Bearing assembly for seat slide. 4,511,187, Cl. 308-3.800.
Rees, Volker: *See—*
Korner, Gerhard; Plettner, Horst; Viering, Walter; and Rees, Volker, 4,511,775, Cl. 200-148.00A.
Regitz, Alfred P.: *See—*
Jennings, Charles E.; Barrington, Claud C.; Chen, Lien-Yan; Hopkins, Bob C.; McIntyre, John N.; and Regitz, Alfred P., 4,510,960, Cl. 137-75.000.
Regnault, Alain: *See—*
Dureigne, Bernard; Guerillot, Stephane; and Regnault, Alain, 4,511,992, Cl. 364-825.000.
Reichgott, David W.; and Leary, Michael J., to Betz Laboratories, Inc. Method for cleaning organically fouled anion exchange resins using diethylene glycol compound or derivative. 4,511,676, Cl. 521-26.000.
Reichman, Benjamin; and Byvik, Charles E., to United States of America, National Aeronautics and Space Administration. Method for determining the point of zero zeta potential of semiconductor. 4,511,838, Cl. 324-71.500.
Reichman, Benjamin: *See—*
Sapru, Krishna; Reichman, Benjamin; and Liang, Gao, 4,511,638, Cl. 429-111.000.
Reid, Don G.: *See—*
Remedi, James J.; Reid, Don G.; and Ure, Lynette, 4,511,914, Cl. 357 45.000.
Reimer, Heinz: *See—*
Bromme, Irmfried; Brunner, Reinhold; and Reimer, Heinz, 4,511,993, Cl. 364-900.000.
Reith, Walter: *See—*
Walter, Lothar; and Reith, Walter, 4,511,188, Cl. 308-6.00C.
Remedi, James J.; Reid, Don G.; and Ure, Lynette, to Motorola, Inc. Power bus routing for providing noise isolation in gate arrays. 4,511,914, Cl. 357-45.000.

Renfroe, Harri• B., to Ciba-Geigy Corporation. 3-Substituted-2-(heteroaryl) indoles. 4,511,573, Cl. 514-332.000.
Reng, Leonhard, to Siemens Aktiengesellschaft. Device for determining a parameter signal for a voltage-fed load. 4,511,978, Cl. 364-480.000.
Renge, Tsumoru: *See*—
Ninagawa, Yoichi; Yamada, Osamu; Renge, Tsumoru; Kyo, Sunao; Osaki, Takayoshi; and Kushida, Koichi, 4,511,751, Cl. 585-608.000.
Requejo, Luz P.; and Butke, Charles J., to Drackett Company, The. Composition for cleaning and imparting antistatic properties to plastics surfaces. 4,511,489, Cl. 252-172.000.
Resonant Technology Company: *See*—
Gurries, Raymond A., 4,511,282, Cl. 404-90.000.
Reusch, Heinz: *See*—
Bindl, Max; and Reusch, Heinz, 4,510,891, Cl. 122-32.000.
Reutter, Heinrich, to Reutter Metallwarenfabrik GmbH. Closure assembly particularly for a radiator filler tube of a motor vehicle. 4,511,056, Cl. 220-204.000.
Reutter Metallwarenfabrik GmbH: *See*—
Reutter, Heinrich, 4,511,056, Cl. 220-204.000.
Revak, Timothy T.: *See*—
Anand, Joginder N.; Revak, Timothy T.; and Rossini, Frank J., 4,510,681, Cl. 29-623.100.
Rex Industries Co., Ltd.: *See*—
Kouchi, Takashi; and Tamaoki, Eiki, 4,511,826, Cl. 318-98.000.
Rhone-Poulenc Chimie de Base: *See*—
Gauthier-Lafaye, Jean; Perron, Robert; and Doussain, Claude, 4,511,517, Cl. 260-549.000.
Ribaldone, Giuseppe; Felicioli, Maria G.; Santini, Claudio; and Agnes, Giovanni, to Farmitalia Carlo Erba S.p.A. Preparation of pyrazine derivatives. 4,511,718, Cl. 544-406.000.
Richardson-Vicks Inc.: *See*—
Shah, Nutan B., 4,511,486, Cl. 252-90.000.
Richarts, Fritz, to H. Krantz GmbH & Co. Heat recovery method. 4,510,762, Cl. 62-79.000.
Rickard, Earl K.: *See*—
Wincze, Steven P.; and Rickard, Earl K., 4,510,892, Cl. 122-510.000.
Ricoh Company, Ltd.: *See*—
Uozumi, Osamu, 4,510,833, Cl. 83-205.000.
Yano, Takashi, 4,511,236, Cl. 355-3.0BE.
Rieber, Norbert; Boehm, Heinrich; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Halogenated 1-hydroxypyrazoles. 4,511,723, Cl. 548-376.000.
Riemer, Pierce W. F.: *See*—
Robinson, Joseph G.; and Riemer, Pierce W. F., 4,511,749, Cl. 585-469.000.
Rieter-Scragg Limited: *See*—
Lawrence, Christopher J.; Wilkinson, Philip M.; and Atkinson, Colin, 4,510,744, Cl. 57-280.000.
Rigby, Malcolm J.: *See*—
Evason, John; Rigby, Malcolm J.; and Ward, Peter, 4,511,384, Cl. 65-114.000.
Rijckaert, Albert M. A.: *See*—
Hofelt, Mørtijn H. H.; de Niet, Edmond; and Rijckaert, Albert M. A., 4,511,933, Cl. 360-47.000.
Rindal, Abraham E.: *See*—
Griffis, Patrick D.; and Rindal, Abraham E., 4,511,924, Cl. 358-197.000.
Rinehart, John R. Method of making a composite foam taxidermy mannikin involving the use of a cleanable adhesive to hold the artificial eyes in the mold cavity. 4,511,522, Cl. 264-46.400.
Risi, Alfred. Torsion coiler. 4,510,782, Cl. 72-142.000.
Risse, Gerhard: *See*—
Luther, Gunter; Loebel, Peter; Risse, Gerhard; and Leiser, Volker, 4,510,932, Cl. 128-204.290.
RISVIN - Ricerche e Sviluppo Industriale - S.r.l.: *See*—
Zamboni, Alderino, 4,511,027, Cl. 198-478.000.
Rittal-Werk Rudolf Loh GmbH & Co. KG: *See*—
Erlam, David P.; and Carr, Arthur E., 4,511,199, Cl. 339-45.00M.
Rivallin, Jose : *See*—
Boy-Marcotte, Jean-Louis; Dahan, Gilbert M. I.; Dancette, Michel; Le Nabour, Marcel P.; Pellerin, Jean-Francois G. A.; Rivallin, Jose ; and Jannot, Marcel A. J., 4,511,805, Cl. 290-2.000.
Robbins & Myers, Inc.: *See*—
Pearce, Richard A., 4,511,310, Cl. 416-134.00R.
Roberson, Morris L.: *See*—
Anjier, Joseph L.; Roberson, Morris L.; and Atchison, William E., 4,511,542, Cl. 423-127.000.
Robert Bosch GmbH: *See*—
Bodig, Bernd; Hohne, Gerd; and Schmied, Helmut, 4,512,019, Cl. 371-12.000.
Buchner, Norbert; and Vogele, Gunther, 4,511,538, Cl. 422-303.000.
Eisele, Hermann; and Stein, Volkhard, 4,510,908, Cl. 123-449.000.
Kampichler, Gunter, 4,510,796, Cl. 73-119.00A.
Leiber, Heinz, 4,510,905, Cl. 123-360.000.
Sumal, Jaihind S., 4,510,795, Cl. 73-118.000.
Roberts, Charles D.; and Cave, Ben R., to Lone Star Steel Company. Method and composition for fluidization of accumulated pit scrap in soaking pits. 4,511,124, Cl. 266-44.000.
Roberts, Franklin D.: *See*—
Spiegel, Martin A.; and Roberts, Franklin D., 4,511,183, Cl. 301-37.00S.
Roberts, James E.: *See*—
Huerta, Jose L.; Rachui, Roy A.; Roberts, James E.; and Simpson, Grainger I., Jr., 4,511,135, Cl. 271-126.000.
Roberts, James R., to A. O. Smith Harvestore Products, Inc. Pump position retainer apparatus. 4,511,257, Cl. 366-262.000.
Roberts, Patrick A. Multi-cube puzzle. 4,511,144, Cl. 273-153.00S.
Robertson, Michael L., to B. B. Robertson Company. Compact barbecue oven. 4,510,854, Cl. 99-337.000.
Robinson, James R., to Petrolite Corporation. Plural stage desalting-/dehydrating apparatus. 4,511,452, Cl. 204-302.000.
Robinson, Joseph G.; and Riemer, Pierce W. F., to Coal Industry Patents Limited. Conversion of methanol to toluene using amorphous silica-alumina catalysts. 4,511,749, Cl. 585-469.000.
Robinson, Richard T., to Delta Engineering Co. Connector unit for geodesic dome frame strut. 4,511,278, Cl. 403-172.000.
Robotic Vision Systems, Inc.: *See*—
Di Matteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 4,511,252, Cl. 356-375.000.
Roccaforte, Harry I., to Champion International Corporation. Easy opening carton. 4,511,043, Cl. 206-620.000.
Rock-Tenn Company: *See*—
Wischusen, Henry, III, 4,511,042, Cl. 206-611.000.
Rockwell International Corporation: *See*—
Deasy, Richard E., 4,511,900, Cl. 343-845.000.
Rodi & Wienenberger: *See*—
Ratz, Gerhard, 4,510,746, Cl. 59-79.100.
Rodrigues, Allan B. J.: *See*—
Falcoff, Allan F.; Mikkelsen, Eric; and Rodrigues, Allan B. J., 4,511,251, Cl. 356-246.000.
Rodriguez, Michael J., to Micron International, Ltd. Electronic security and surveillance system. 4,511,886, Cl. 340-534.000.
Rodth, Joseph J., to Alco Foodservice Equipment Company. Connector for pressurized source of beverage concentrate. 4,510,969, Cl. 137-614.050.
Roesler, Richard F., to NL Industries, Inc. Surveying of boreholes using shortened non-magnetic collars. 4,510,696, Cl. 33-304.000.
Rogers Corporation: *See*—
Gottlieb, Michael M., 4,511,951, Cl. 361-433.000.
Rogers, Noel A., to International Medical Electronics, Ltd. Method and apparatus for operating dual diathermy applicator heads in close proximity to one another. 4,510,937, Cl. 128-422.000.
Rogers, Robert B.: *See*—
Giles, Michael K.; and Rogers, Robert B., 4,511,219, Cl. 350-388.000.
Rohling, Wilhelm: *See*—
Ernst, Hans-Otto; and Rohling, Wilhelm, 4,511,955, Cl. 362-347.000.
Rohm GmbH: *See*—
Kramer, Dieter; Pennewiss, Horst; Plainer, Hermann; Schnee, Reiner; and Schleier, Waldemar, 4,511,694, Cl. 525-54.100.
Rohr Industries, Inc.: *See*—
Cadwell, Gilbert C., 4,510,780, Cl. 72-57.000.
Rohr, Jurgen: *See*—
Frungel, Frank; and Rohr, Jurgen, 4,511,249, Cl. 356-5.000.
Rohrbach, Ronald P.; Maliarik, Mary J.; and Malloy, Thomas P., to UOP Inc. Production of high sugar syrups. 4,511,654, Cl. 435-95.000.
Roman, Alain: *See*—
Tournier, Herve; Johansson, Allan A.; Sachetto, Jean-Pierre; Armanet, Jean-Michel; Michel, Jean-Pierre; and Roman, Alain, 4,511,433, Cl. 162-16.000.
Romanauskas, William A., to Du Pont de Nemours, E. I., and Company. Suspension system for a centrifuge rotor. 4,511,350, Cl. 494-82.000.
Romier, Roger; and Betoliere, Jean-Pierre, to Alsthom-Atlantique. Break chamber for a gas-blast circuit breaker. 4,511,776, Cl. 200-148.00A.
Rommen, Hans; and Frosch, Hans, to SMS-Schloemann Siemag AG. Changing rolls in six-high roll stand. 4,510,783, Cl. 72-200.000.
Roncaglione, James W. Vehicle washing apparatus having flexible brushes. 4,510,639, Cl. 15-53.0AB.
Rorer, Morris P., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,511,392, Cl. 71-90.000.
Roschmann, Klaus: *See*—
Knothe, Herbert; and Roschmann, Klaus, 4,512,007, Cl. 369-127.000.
Rose, Emery L.: *See*—
Janisiewicz, Stanley W.; and Rose, Emery L., 4,510,806, Cl. 73-432.00R.
Rose, Wolfgang, to VEB Kombinat Textima. Control device for a knitting machine. 4,510,774, Cl. 66-75.200.
Rosebrooks, Nathan B., to ITT Corporation. Device for providing a dual coating on an optical fiber. 4,510,884, Cl. 118-405.000.
Ross, Dieter; and Ostertag, Klaus, to Erwin Sick GmbH Optik-Elektronik. Fault detection apparatus for material webs. 4,511,803, Cl. 250-563.000.
Ross, Joseph A.: *See*—
Di Matteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 4,511,252, Cl. 356-375.000.
Ross, Peter W.: *See*—
Crossland, William A.; Ross, Peter W.; and Ayliffe, Peter J., 4,511,926, Cl. 358-236.000.
Rossell, Thomas L. Electric fence gate switch. 4,511,771, Cl. 200-61.730.
Rossi, Guglielmo, to Ranco Incorporated. Control unit for refrigerators or freezers. 4,510,765, Cl. 62-154.000.

Rossini, Frank J.: *See*—
Anand, Joginder N.; Revak, Timothy T.; and Rossini, Frank J., 4,510,681, Cl. 29-623.100.
Rossmann, Axel: *See*—
Huther, Werner; and Rossmann, Axel, 4,511,612, Cl. 428-36.000.
Rostrup-Nielsen, Jens R.: *See*—
Pedersen, Karsten; Rostrup-Nielsen, Jens R.; and Jorgensen, Ib Greve H., 4,511,674, Cl. 518-714.000.
Roth, Johann, to Braun Aktiengesellschaft. Method of soldering circuit boards with solder-repellent contacts. 4,511,076, Cl. 228-180.100.
Rothfuss, Werner: *See*—
Kuehn, Volker; Rothfuss, Werner; and Widmaier, Richard, 4,511,421, Cl. 156-356.000.
Rotramel, George L.; Veilleux, Daniel P.; and Allen, Joseph L., to Union Carbide Corporation. Pest repellant. 4,511,579, Cl. 514-490.000.
Rousseau, Alan D.: *See*—
Fohrenkamm, Elsie A.; and Rousseau, Alan D., 4,511,646, Cl. 430-283.000.
Rousselin, Jean: *See*—
Trioulеyre, Jean; Rousselin, Jean; Schmit, Patrick; and Gondry, Philippe, 4,510,785, Cl. 72-323.000.
Roussos, Theodore; and Sakhuja, Ravinder K., to Thermo Electron Corporation; and Thermo Electron Corporation. Energy storage system having thermally stratified liquid. 4,510,922, Cl. 126-435.000.
Roybal, Herman E.: *See*—
Taylor, Gene W.; and Roybal, Herman E., 4,511,373, Cl. 51-298.000.
Rozsa, Zsuzsanna: *See*—
Szendrei, Kalman; Minker, Emil; Rozsa, Zsuzsanna; Koch, Lehel; and Wolf, Lajos, 4,511,559, Cl. 514-54.000.
Rubber-en Kunststoffabriek ENBI B.V.: *See*—
Lock, Pieter J., 4,510,664, Cl. 29-450.000.
Ruehle, Edward A., to Chrysler Corporation. Engine test stand. 4,511,112, Cl. 248-544.000.
Ruhoff, Philip J.: *See*—
Anderson, Jeffrey L.; Ruhoff, Philip J.; and Edenborg, Robert B., 4,511,692, Cl. 525-7.000.
Ruhrchemie Aktiengesellschaft: *See*—
Cornils, Boy; Weber, Jurgen; Tihanyi, Bela; and DeWin, Werner, 4,511,439, Cl. 204-37.100.
Rummelsburg, Al S., to Kidde Consumer Durables Corp. Cookware and method of making the same. 4,511,077, Cl. 228-228.000.
Runquist, Paul. Passive mode solid fuel burning furnace. 4,510,917, Cl. 126-76.000.
Runyan, William S., to Iowa State University Research Foundation, Inc. Projection screen anchor. 4,511,211, Cl. 350-117.000.
Runyon, James R.; and Valenti, Salvatore, to Sandoz Ltd. Water-soluble precondensates useful for improving the fastness of dyes and optical brighteners on hydroxy group-containing substrates. 4,511,707, Cl. 528-250.000.
Ruscitti, Tomaso; Albini, Giovanni; Torretta, Roberto; and Incerti Baldi, Andrea, to S.A.R. S.p.A. Valve and cap assembly for dispensing fluid materials under pressure with warranty seal. 4,511,064, Cl. 222-153.000.
Russell, Bruce A.; and Abdel-Fattah, Adnan M., to James Howden Australia Pty. Limited. Axial and mixed flow fans and blowers. 4,511,308, Cl. 415-191.000.
Russell, Gordon A.: *See*—
Quigley, M. Scott; and Russell, Gordon A., 4,510,801, Cl. 73-153.000.
Rustomji, Sam H., to Sigmatron Associates. Mask for vacuum depositing back metal electrodes on EL panel. 4,511,599, Cl. 427-66.000.
Ruth, Ursula: *See*—
Sternberg, Walter; Schreyer, Fritz; and Ruth, Ursula, 4,510,811, Cl. 73-611.000.
Rutschmann, Erwin, to Dr. Ing. h.c.f. Porsche Aktiengesellschaft. Multi-cylinder combustion engine intake manifold. 4,510,896, Cl. 123-52.0MB.
Ryang, Hong-Son, to General Electric Company. Heat curable epoxy resin compositions and epoxy resin curing agents. 4,511,701, Cl. 525-533.000.
S.A.R. S.p.A.: *See*—
Ruscitti, Tomaso; Albini, Giovanni; Torretta, Roberto; and Incerti Baldi, Andrea, 4,511,064, Cl. 222-153.000.
S & F Orthopadietechnik GmbH: *See*—
Frank, Xaver, 4,510,957, Cl. 135-84.000.
S.N.E.C.M.A.: *See*—
Fillion, Jean-Claude, 4,510,809, Cl. 73-457.000.
S.O.C. Corporation: *See*—
Arikawa, Hiroo, 4,511,875, Cl. 337-201.000.
S & S Corporation: *See*—
Evans, Robert E., 4,511,637, Cl. 429-100.000.
Sabatino, Anthony; Schaumburg, Edward G.; Recht, Peter A.; Olszewski, Douglas J.; and Strait, Richard T., to GNB Batteries Inc. Apparatus and method for assembling battery cell elements. 4,510,682, Cl. 29-623.100.
Sachetto, Jean-Pierre: *See*—
Tournier, Herve; Johansson, Allan A.; Sachetto, Jean-Pierre; Armanet, Jean-Michel; Michel, Jean-Pierre; and Roman, Alain, 4,511,433, Cl. 162-16.000.
Saegusa, Kazuyuki: *See*—
Komatsu, Fumiaki; Saegusa, Kazuyuki; Seshimo, Yu; and Yamashita, Norio, 4,510,767, Cl. 62-200.000.
Sagues, Alberto A.: *See*—
Baumert, Kenneth L.; Sagues, Alberto A.; and Davis, Burtron H., 4,511,453, Cl. 208-8.0LE.
Baumert, Kenneth L.; Sagues, Alberto A.; and Davis, Burtron H., 4,511,460, Cl. 208-348.000.
Sahakian, Diran R.; Pellerin, Lucien; and Nijboer, Sjoerd, to U.S. Philips Corporation. Multi-path interruptor device. 4,511,769, Cl. 200-6.00A.
Saho, Norihide: *See*—
Matsuda, Toshiharu; Imamura, Minoru; and Saho, Norihide, 4,510,771, Cl. 62-514.00R.
Saint-Amour, John D. Fluid gauging. 4,510,805, Cl. 73-37.900.
St. Joseph's Hospital and Medical Center: *See*—
Wilt, Chester F., Jr., 4,511,157, Cl. 280-289.0WC.
Saint-Prix, Robert; and Montmartin, Henri, to Societe Nouvelle des Etablissements Dervaux. Anchoring or connecting sleeve for multistrand cable conductor. 4,511,280, Cl. 403-274.000.
Saito, Etsuro, to Sony Corporation. Magnetic disk cartridge. 4,511,944, Cl. 360-133.000.
Saito, Noboru; Satake, Takeshi; Aoki, Ryuji; and Nagai, Isao, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Catalyst for manufacturing methacrolein. 4,511,671, Cl. 502-242.000.
Saito, Tadao: *See*—
Tsukada, Takami; Akutsu, Masao; and Saito, Tadao, 4,511,418, Cl. 156-245.000.
Sakaeda, Keiko: *See*—
Sashiki, Takashi; and Sakaeda, Keiko, 4,511,010, Cl. 177-25.000.
Sakaguchi, Shinji: *See*—
Okamura, Hisashi; Sakaguchi, Shinji; Takahashi, Osamu; and Murai, Ashita, 4,511,644, Cl. 430-219.000.
Sakai, Hiroshi: *See*—
Matsui, Fumio; Aono, Shin; Sakai, Hiroshi; Hattori, Katsuhide; and Kakino, Shigeru, 4,511,414, Cl. 149-109.600.
Sakai, Takashi; Honda, Naojiro; and Yonezu, Ikuo, to Agency of Industrial Science & Technology. Metalhydride container and metal hydride heat storage system. 4,510,759, Cl. 62-48.000.
Sakakibara, Hidekazu: *See*—
Kakino, Shigeru; Hattori, Katsuhide; Fukatsu, Yoshiaki; Moriyama, Hideo; and Sakakibara, Hidekazu, 4,511,412, Cl. 149-109.600.
Sakakibara, Shinsuke: *See*—
Inaba, Hajimu; and Sakakibara, Shinsuke, 4,511,985, Cl. 364-513.000.
Sakakibara, Yasuji: *See*—
Yoneda, Takao; and Sakakibara, Yasuji, 4,510,719, Cl. 51-289.00R.
Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha; and Fuji Jukogyo Kabushiki Kaisha. System for regulating the idle speed of an internal combustion engine. 4,510,903, Cl. 123-339.000.
Sakamoto, Koichiro: *See*—
Nishikawa, Hisashi; Suzuki, Satoshi; Hirata, Masanobu; Sakamoto, Koichiro; Fujisawa, Ikuo; and Takeno, Shozo, 4,511,877, Cl. 338-2.000.
Sakamoto, Takashi, to Dainippon Screen Seizo Kabushiki Kaisha. Linear interpolating method and color conversion apparatus using this method. 4,511,989, Cl. 364-723.000.
Sakanaka, Yasuhiro: *See*—
Ariyoshi, Takashi; Emura, Noriaki; and Sakanaka, Yasuhiro, 4,511,679, Cl. 521-83.000.
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, to Mitsui Toatsu Kagaku Kabushiki Kaisha. N-(4-Phenyl-2-thiazolyl)carbamate derivatives. 4,511,574, Cl. 514-371.000.
Sakano, Kozaburo: *See*—
Yazaki, Jinichi; and Sakano, Kozaburo, 4,511,610, Cl. 428-35.000.
Sakata, Hiromi: *See*—
Tsudaka, Hideaki; Washio, Takaji; Kozuka, Nobuhiko; Iseki, Masahide; Watanabe, Toshio; Kai, Masami; Yoshiyama, Toshio; and Sakata, Hiromi, 4,511,241, Cl. 355-14.0CU.
Sakhuja, Ravinder K.: *See*—
Roussos, Theodore; and Sakhuja, Ravinder K., 4,510,922, Cl. 126-435.000.
Salerno, Giuseppe: *See*—
Bulaty, Paul; De Mesmaeker, Ivan; Franc, Zdenek; and Salerno, Giuseppe, 4,511,839, Cl. 324-127.000.
Salit, Herbert W.: *See*—
Pitts, Warren R.; and Salit, Herbert W., 4,511,616, Cl. 428-203.000.
Salyers, Glen M.: *See*—
Greene, Dennis T.; and Salyers, Glen M., 4,510,834, Cl. 83-453.000.
Sam J. Brown Land & Cattle Company, Inc.: *See*—
Brown, Sam J., 4,511,005, Cl. 172-430.000.
Sampei, Takeshi; Miyahara, Norio; Nikaido, Tadanobu; Sato, Hiroaki; and Aoyama, Keizo, to Fujitsu Limited. Time-switch circuit. 4,512,012, Cl. 370-66.000.
Samsonite Corporation: *See*—
Castelli, Renato, 4,511,036, Cl. 206-371.000.
San-Ei Kagaku Co., L.T.D.: *See*—
Watanabe, Katsuhiro; Minei, Masayuki; and Horikoshi, Toshio, 4,510,951, Cl. 132-7.000.
Sandner, Klaus: *See*—
Vollbrecht, Heinz-Rudiger; Schutz, Erwin; and Sandner, Klaus, 4,511,508, Cl. 426-665.000.
Sandoz Ltd.: *See*—
Runyon, James R.; and Valenti, Salvatore, 4,511,707, Cl. 528-250.000.

Sanford, James R. M.: *See—*
Guadagno, Philip A.; and Sanford, James R. M., 4,511,533, Cl. 422-61.000.
Sangroni, Roberto. Ball carrier system. 4,510,982, Cl. 150-52.00A.
Sankrithi, Mithra M. K. V. Electronic maze game. 4,511,143, Cl. 273-153.00R.
Sankrithi, Mithra M. K. V. Aerodynamic device for land vehicles. 4,511,170, Cl. 296-1.00S.
Sanner, Jim W.: *See—*
McKinley, Mark J.; and Sanner, Jim W., 4,511,477, Cl. 210-689.000.
Santini, Claudio: *See—*
Ribaldone, Giuseppe; Felicioli, Maria G.; Santini, Claudio; and Agnes, Giovanni, 4,511,718, Cl. 544-406.000.
Santy, Jean: *See—*
Peroux, Bernard; Santy, Jean; and Sutter, Jean, 4,510,965, Cl. 137-375.000.
Saperstein, David D.: *See—*
Bellar, Robert J.; Golden, William G.; Saperstein, David D.; and Vats, Ashok, 4,511,986, Cl. 364-576.000.
Saprokhin, Alexander M.; Friedland, David J.; Baran, Richard M.; Kim, Jung T.; and McCurry, Lynn E., to Allied Corporation. Process for the electrolytic production of fluorine and novel cell therefor. 4,511,440, Cl. 204-60.000.
Sapru, Krishna; Reichman, Benjamin; and Liang, Gao, to Energy Conversion Devices, Inc. Photoresponsive amorphous semiconductor materials, methods of making the same, and photoanodes made therewith. 4,511,638, Cl. 429-111.000.
Sarnosky, Joseph R.; Wolbrink, David W.; and Otte, Dieter W., to Broan Mfg. Co., Inc. Ventilation fan. 4,510,851, Cl. 98-42.080.
Sasamoto, Tatsuya, to Kabushiki Kaisha Komatsu Seisakusho. Sprocket wheel assembly of endless track-type vehicles. 4,511,186, Cl. 305-57.000.
Sashiki, Takashi; and Sakaeda, Keiko, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing method and apparatus therefor. 4,511,010, Cl. 177-25.000.
Satake, Shozo, to Hitachi, Ltd. Programmable logic array, including an arrangement for invalidating faulty and term outputs. 4,511,812, Cl. 307-465.000.
Satake, Takeshi: *See—*
Saito, Noboru; Satake, Takeshi; Aoki, Ryuji; and Nagai, Isao, 4,511,671, Cl. 502-242.000.
Sato, Hidetaka: *See—*
Makino, Daisuke; Sato, Hidetaka; Suzuki, Hiroshi; Uchimura, Shun-ichiro; and Suzuki, Hiroshi, 4,511,705, Cl. 528-26.000.
Sato, Hiroaki: *See—*
Sampei, Takeshi; Miyahara, Norio; Nikaido, Tadanobu; Sato, Hiroaki; and Aoyama, Keizo, 4,512,012, Cl. 370-66.000.
Sato, Hirotsugu: *See—*
Higashi, Kensaku; Yano, Haruhiko; Sato, Hirotsugu; Sukegawa, Ken; and Ooba, Yuji, 4,511,642, Cl. 430-161.000.
Sato, Koji: *See—*
Kawano, Hikaru; Sato, Koji; and Nogi, Hiroyoshi, 4,511,301, Cl. 414-43.000.
Sato, Shigeru: *See—*
Miyamori, Hideaki; Takagi, Kenji; Sato, Shigeru; Takahashi, Fujio; and Ozawa, Mikio, 4,511,784, Cl. 219-123.000.
Sato, Tsunehiko: *See—*
Anonuma, Masashi; Tamai, Yasuo; Sato, Tsunehiko; Funabashi, Shinichi; and Ogawa, Hiroshi, 4,511,484, Cl. 252-62.540.
Sato, Yasuji: *See—*
Nakayama, Yasunobu; Sato, Yasuji; and Kunii, Takeshi, 4,511,764, Cl. 179-90.0AN.
Sattelmaier, Helmut: *See—*
Karg, Roland; and Sattelmaier, Helmut, 4,511,256, Cl. 366-165.000.
Saucier, David O., to DCI, Inc. Clean-in-place agitator assembly. 4,511,255, Cl. 366-138.000.
Sauer, Wolfgang; and Hoffmann, Wolfgang, to BASF Aktiengesellschaft. Continuous preparation of glyoxal. 4,511,739, Cl. 568-473.000.
Saurer Diederichs (Societe Anonyme): *See—*
Deborde, Albert H.; and Grandvallet, Gilles, 4,510,976, Cl. 139-435.000.
Savin Corporation: *See—*
Hori, Tatsu, 4,511,238, Cl. 355-3.0SH.
Sawano, Toshiyuki: *See—*
Ishino, Yoshitane; Naruse, Toshihisa; and Sawano, Toshiyuki, 4,510,705, Cl. 37-54.000.
Scebold, Robert A.; and Cleary, James D., to Unitek Corporation. Convertible buccal tube/bracket appliance. 4,511,331, Cl. 433-17.000.
Schantz, Raymond G., to Schantz & Sons, Inc. Tilt bed vertically storable utility trailer. 4,511,181, Cl. 298-5.000.
Schantz & Sons, Inc.: *See—*
Schantz, Raymond G., 4,511,181, Cl. 298-5.000.
Schanz, Friedrich; Schucker, Emil; Schucker, Eberhard; and Perrot, Alexander, to Perrot-Regnerbau GmbH & Co. Swivel drive for fan-jet sprinkler. 4,511,085, Cl. 239-242.000.
Schauf, Dieter; Protoschill, Klaus; Oberbach, Karl; and Depcik, Hans-Werner, to Bayer Aktiengesellschaft. Plastic wheel. 4,511,184, Cl. 301-63.0PW.
Schaumburg, Edward G.: *See—*
Sabatino, Anthony; Schaumburg, Edward G.; Recht, Peter A.; Olszewski, Douglas J.; and Strait, Richard T., 4,510,682, Cl. 29-623.100.
Scheie, Carl E.: *See—*
Amos, Homer C.; Benedyk, Joseph C.; Scheie, Carl E.; and McGlove, William R., 4,511,148, Cl. 273-326.000.
Scherf, Thomas W.: *See—*
LaBarge, Robert L.; Horansky, Frank J.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,510,857, Cl. 100-53.000.
LaBarge, Robert L.; Pohlenz, Elmer E.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Leftault, Charles J., Jr.; and Scherf, Thomas W., 4,510,860, Cl. 100-49.000.
Schering Aktiengesellschaft: *See—*
Laurent, Henry; Nickisch, Klaus; Bittler, Dieter; Wiechert, Rudolf; and Losert, Wolfgang, 4,511,565, Cl. 514-173.000.
Schering Corporation: *See—*
Smith, Elizabeth M.; Doll, Ronald J.; and Neustadt, Bernard R., 4,511,569, Cl. 514-290.000.
Scheurer, Stephen M., to Texas Recreation Corporation. Container insulation apparatus. 4,510,665, Cl. 29-460.000.
Schier, John H., Jr.; and Brooks, William E., Jr., to RCA Corporation. Modified deflection yoke coils having shootback windings. 4,511,871, Cl. 335-213.000.
Schildknecht, Albert: *See—*
Hunziker, Martin; and Schildknecht, Albert, 4,511,370, Cl. 48-197.00A.
Schlage Lock Company: *See—*
McGahan, Wallace A., 4,511,946, Cl. 361-172.000.
Schleier, Waldemar: *See—*
Kramer, Dieter; Pennewiss, Horst; Plainer, Hermann; Schnee, Rciner; and Schleier, Waldemar, 4,511,694, Cl. 525-54.100.
Schlitt, Leland G.; and Szoke, Abraham, to United States of America, Energy. Short pulse free electron laser amplifier. 4,511,850, Cl. 330-4.300.
Schlumberger Technology Corporation: *See—*
Guidry, Shelby L.; and DeCuir, Perry J., Sr., 4,510,797, Cl. 73-151.000.
Moran, James H.; and Rau, Rama N., 4,511,842, Cl. 324-338.000.
Thoraval, Yvon, 4,511,843, Cl. 324-338.000.
Schmale, Peter C.: *See—*
Van der Valk, Nicolaas J. L.; Moelands, Antonius G.; and Schmale, Peter C., 4,511,915, Cl. 358-17.000.
Schmanski, Donald W., to Carsonite International Corporation. Road-surface mountable delineator support member. 4,511,281, Cl. 404-10.000.
Schmid, Eduard; and Hoppe, Manfred, to Ems-Inventa AG. Flame retardant polyamides and agent for inducing flame retardancy. 4,511,684, Cl. 524-101.000.
Schmid, Helmut: *See—*
Jager, Theo; and Schmid, Helmut, 4,510,831, Cl. 83-157.000.
Schmidt, Glenn H. Reinforced hollow metal golf club head. 4,511,145, Cl. 273-167.00H.
Schmidt, Lawrence R.; and Lovgren, Eric M., to General Electric Company. Liquid monomer feed pipe for continuous extrusion polymerization. 4,511,535, Cl. 422-137.000.
Schmidt, Michael J.: *See—*
Hazebrook, Daniel W.; Gehrke, Glenn F.; and Schmidt, Michael J., 4,511,346, Cl. 464-146.000.
Schmidt, Paul H.: *See—*
Forrest, Stephen R.; Kaplan, Martin L.; Schmidt, Paul H.; and Venkatesan, Thirumalai N. C., 4,511,445, Cl. 204-158.0HE.
Schmied, Helmut: *See—*
Bodig, Bernd; Hohne, Gerd; and Schmied, Helmut, 4,512,019, Cl. 371-12.000.
Schmit, Patrick: *See—*
Triouleyre, Jean; Rousselin, Jean; Schmit, Patrick; and Gondry, Philippe, 4,510,785, Cl. 72-323.000.
Schmitz, William E., to Westinghouse Electric Corp. Stepper motor door control apparatus and method. 4,511,832, Cl. 318-685.000.
Schmolka, Irving R., to BASF Wyandotte Corporation. Clear analgesic gels with reduced tackiness. 4,511,563, Cl. 514-162.000.
Schnee, Reiner: *See—*
Kramer, Dieter; Pennewiss, Horst; Plainer, Hermann; Schnee, Reiner; and Schleier, Waldemar, 4,511,694, Cl. 525-54.100.
Schoenrock, Karlheinz W., to Amalgamated Sugar Company, The. Method for preventing compaction in sorbent beds. 4,511,476, Cl. 210-678.000.
Schofield, John, to U.S. Philips Corporation. Acoustic surface wave device including a reflective multistrip coupler. 4,511,867, Cl. 333-195.000.
Schour, Avi; and Bloch, Igal, to H. H. Brown Shoe Co., Inc. Athletic shoe and counter. 4,510,701, Cl. 36-68.000.
Schramm, George W.: *See—*
Fulcomer, Emanuel J., Jr.; Nici, Richard J.; Poteat, Vance E.; Schramm, George W.; Sharp, John B.; and Winseck, Michael M., Jr., 4,512,016, Cl. 370-110.100.
Nici, Richard J.; Schramm, George W.; and Sharp, John B., 4,512,017, Cl. 370-110.100.
Schreyer, Fritz: *See—*
Sternberg, Walter; Schreyer, Fritz; and Ruth, Ursula, 4,510,811, Cl. 73-611.000.
Schrock, Clifford B., to C-Cor Labs, Inc. Remote level adjustment system for use in a multi-terminal communications system. 4,512,033, Cl. 455-2.000.
Schrodter, Klaus; and Maurer, Alexander, to Hoechst Aktiengesellschaft. Linear, substantially water-insoluble ammonium polyphosphates and process for making them. 4,511,546, Cl. 423-305.000.
Schron, Jack H.; and Seidel, Lawrence H., to Jergens, Inc. Hydraulic-mechanical clamping device. 4,511,127, Cl. 269-32.000.

Schuck, Helmut: *See*—
Forster, Karl-Heinz; Schuck, Helmut; Johne, Hans; and Jentzsch, Arndt, 4,510,867, Cl. 101-365.000.

Schucker, Eberhard: *See*—
Schanz, Friedrich; Schucker, Emil; Schucker, Eberhard; and Perrot, Alexander, 4,511,085, Cl. 239-242.000.

Schucker, Emil: *See*—
Schanz, Friedrich; Schucker, Emil; Schucker, Eberhard; and Perrot, Alexander, 4,511,085, Cl. 239-242.000.

Schuettpelz, Daryl, to C.R.O. Inc. Punch marker height control. 4,511,977, Cl. 364-475.000.

Schuler, John G.; and Lingenfelter, Lowell R., to Teledyne Industries, Inc. Printed circuit board connector with integral ground plane. 4,511,196, Cl. 339-14.00R.

Schulties, Joseph R.: *See*—
Meuschke, Robert E.; and Schulties, Joseph R., 4,511,499, Cl. 252-626.000.

Schumacher, Gerald F., to Minnesota Mining and Manufacturing Company. One-part moisture-curable polyurethane adhesive, coating, and sealant compositions. 4,511,626, Cl. 428-425.600.

Schurr, Heinrich: *See*—
Dittner, Adam; Schurr, Heinrich; and Von Wallenberg, Ducius, 4,511,971, Cl. 364-426.000.

Schuster, Wilhelm: *See*—
Jovy, Herbert; and Schuster, Wilhelm, 4,510,629, Cl. 4-332.000.

Schutten, Herman P.: *See*—
Benjamin, James A.; and Schutten, Herman P., 4,511,818, Cl. 310-338.000.

Schutz, Erwin: *See*—
Vollbrecht, Heinz-Rudiger; Schutz, Erwin; and Sandner, Klaus, 4,511,508, Cl. 426-665.000.

Schwabe, Ulrich; Neppl, Franz; and Hieber, Konrad, to Siemens Aktiengesellschaft. Method for the manufacture of integrated MOS-field effect transistor circuits silicon gate technology having diffusion zones coated with silicide as low-impedance printed conductors. 4,510,670, Cl. 29-571.000.

Schwanbom, Erik: *See*—
Wendt, Michael; and Schwanbom, Erik, 4,510,933, Cl. 128-207.140.

Schwankl, Rose M. Magnetically attached storm windows and the like. 4,510,986, Cl. 160-354.000.

Schwartz, Jack; and Wu, Tai T. Method and apparatus for evaluation of color information in photographic processes. 4,511,229, Cl. 354-20.000.

Schwarz, Karl-Heinz: *See*—
Heck, Gunter; Lienerth, Aladar; Malow, Egon; Schwarz, Karl-Heinz; and Faust, Uwe, 4,511,437, Cl. 203-19.000.

Schwarzler, Peter: *See*—
Habeck, Reinhold; Mackiol, Norbert; Mautner, Franz; and Schwarzler, Peter, 4,510,871, Cl. 105-167.000.

Schweiger, Erwin; Starmuehler, Erwin; and Temmesfeld, Axel, to Bayerische Motoren Werke AG. Cooling circuit for internal combustion engines. 4,510,893, Cl. 123-41.020.

Schweizer, Ernst: *See*—
Gallay, Jean J.; and Schweizer, Ernst, 4,511,567, Cl. 514-253.000.

SCM Corporation: *See*—
Abbey, Kirk J.; and Kunz, Barbara L., 4,511,446, Cl. 204-181.00C.
Percel, Phillip J.; and Perkins, Douglas W., 4,511,584, Cl. 426-99.000.
Percel, Phillip J.; Perkins, Douglas W.; and Petricca, Anthony V., 4,511,592, Cl. 426-646.000.

Scott, Edward. Bicycle brake mechanism. 4,511,018, Cl. 188-24.120.

Scully, Charles N., to United States of America, Air Force. Laser target speckle eliminator. 4,511,220, Cl. 350-403.000.

Sea-Land Industries, Inc.: *See*—
van Iperen, Willem H. P., 4,510,652, Cl. 24-68.0CD.

Seaward, William S.: *See*—
Ashbee, William H.; Janssen, Donovan M.; Martin, Ronald J.; and Seaward, William S., 4,511,242, Cl. 355-14.00C.

Seeq Technology, Inc.: *See*—
Gupta, Anil, 4,511,811, Cl. 307-463.000.

Seguenot, Gabriel, to Societe Nouvelle Auxim (Societe Anonyme). Device providing an effective seal for a spherical rotary slide valve. 4,511,150, Cl. 277-12.000.

Seidel, Lawrence H.: *See*—
Schron, Jack H.; and Seidel, Lawrence H., 4,511,127, Cl. 269-32.000.

Seifert, William F. C.: *See*—
Stone, Carroll E.; and Seifert, William F. C., 4,511,545, Cl. 423-240.000.

Seimiya, Ryubun; Tarumi, Noriyoshi; Kokiso, Masakazu; and Tsuchiya, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Intermediate transfer member for transferring toner image on a carrier. 4,511,622, Cl. 428-323.000.

Seite, Claude; Commereuc, Dominique; and Chauvin, Yves, to Institut Francais du Petrole. Process for homologating alcohols through the intermediate production of ketals with cobalt carbonyl complexes as catalysts. 4,511,743, Cl. 568-814.000.

Sekizawa, Hidekazu; Iwamoto, Akito; Togashi, Kousaku; and Fujie, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha; and Toshiba Machine Co., Ltd. Apparatus for measuring the area of image portion of image-bearing member. 4,510,866, Cl. 101-365.000.

Sella, Claude; Tran-Khanh, Vien; and Martin, Jean-Claude, to Centre National de la Recherche Scientifique. Devices for preparing substrates coated with a thin layer of platinum oxide and substrates so coated. 4,511,451, Cl. 204-298.000.

Semanko, Mark. Method and apparatus for tying balloons and the like. 4,510,653, Cl. 24-131.00C.

Semrow, Carolyn M.; Kolstedt, Mark W.; and Dunn, William J., to Kendall Company, The. Temperature, pulse and respiration mouthpiece probe. 4,510,941, Cl. 128-671.000.

Sephton, Hugo H. Feed distribution method for vertical tube evaporation. 4,511,432, Cl. 159-47.100.

Seragnoli, Enzo, to G.D. Societa Per Azioni. Device for transferring and verifying batches of cigarettes. 4,511,045, Cl. 209-535.000.

Serban, Alexander; Watson, Keith G.; Bird, Graham J.; and Farquharson, Graeme J., to ICI Australia Limited. Cyclohexane-1,3-dione derivatives and their herbicidal compositions and methods. 4,511,391, Cl. 71-88.000.

Serev, Peter G.; and Bogin, Roger M., to C & A Products, Inc. Programmable limit switch system using a resolver-to-digital angle converter. 4,511,884, Cl. 340-347.0SY.

Seshimo, Yu: *See*—
Komatsu, Fumiaki; Saegusa, Kazuyuki; Seshimo, Yu; and Yamashita, Norio, 4,510,767, Cl. 62-200.000.

Shah, Mahesh, to Northern Telecom Limited. Key telephone system signalling and control arrangement. 4,511,766, Cl. 179-99.00A.

Shah, Mahesh: *See*—
Wetzel, David L.; and Shah, Mahesh, 4,511,767, Cl. 179-99.00A.

Shah, Nutan B., to Richardson-Vicks Inc. Method of cleaning dentures using aerated foams. 4,511,486, Cl. 252-90.000.

Shah, Shirish M., to Orr Felt Company, The. Method of marking papermakers' felt by transfer printing. 4,511,361, Cl. 8-471.000.

Shaken Co., Ltd.: *See*—
Fukuda, Shinichiro, 4,511,893, Cl. 340-747.000.

Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., to Ethicon, Inc. Copolymers of a 4,4'-(ethylenedioxy)bis benzoate, an alkylene diol and a (2-alkenyl or alkyl) succinic anhydride. 4,511,706, Cl. 528-192.000.

Shank, Brian E., to Kerr Glass Manufacturing Corporation. Tamper-evident closure and method of manufacture. 4,511,054, Cl. 215-252.000.

Shapiro, Eugene; and Mandigo, Frank N., to Olin Corporation. Copper-tin alloys having improved wear properties. 4,511,410, Cl. 148-13.200.

Sharp, John B.: *See*—
Fulcomer, Emanuel J., Jr.; Nici, Richard J.; Poteat, Vance E.; Schramm, George W.; Sharp, John B.; and Winseck, Michael M., Jr., 4,512,016, Cl. 370-110.100.
Nici, Richard J.; Schramm, George W.; and Sharp, John B., 4,512,017, Cl. 370-110.100.

Sharp Kabushiki Kaisha: *See*—
Hara, Takafumi, 4,511,906, Cl. 346-140.00R.
Miyamae, Ryuichi; and Yasuda, Haruo, 4,510,942, Cl. 128-680.000.
Miyamae, Ryuichi, 4,510,943, Cl. 128-680.000.
Mochizuki, Daisuke; Ohnishi, Souichi; and Komai, Kensaku, 4,512,027, Cl. 377-16.000.
Nakatani, Hiroshi; and Yamamoto, Hachizou, 4,511,891, Cl. 340-734.000.
Nishiyama, Haruo, 4,511,246, Cl. 355-75.000.
Sumitani, Toshihiko; and Komeda, Kenichiro, 4,511,138, Cl. 273-1.00E.
Takamatsu, Toshiaki; and Nonomura, Keisaku, 4,511,217, Cl. 350-336.000.

Shedigian, Vandos, to Emhart Industries, Inc. Aromatic dielectric fluid for a capacitor. 4,511,949, Cl. 361-319.000.

Sheh, Chen-Piau. Fishing scaling apparatus. 4,510,644, Cl. 17-64.000.

Shell Oil Company: *See*—
Durbin, Daniel P.; and Korcz, William H., 4,511,696, Cl. 525-92.000.
Hasenack, Hendrikus J. A., 4,510,874, Cl. 110-347.000.
Heinerman, Jacobus J. L., 4,511,752, Cl. 585-739.000.

Sherwin, Dewayne J., to Coburn Optical Industries, Inc. Lens finishing apparatus. 4,510,717, Cl. 51-58.000.

Shibata, Keiichi: *See*—
Konoki, Keizo; Shinohara, Takanobu; Kochi, Ikuyoshi; Shibata, Keiichi; Nishihara, Hisakatsu; Morichika, Toshiaki; Sugitani, Junichi; and Tsuchida, Koji, 4,510,988, Cl. 164-102.000.

Shibuya, Masanobu: *See*—
Kawabata, Susumu; Inoue, Tetsuzo; Miyamoto, Noriaki; Shibuya, Masanobu; and Kaneko, Masashi, 4,510,745, Cl. 57-415.000.

Shibuya, Tsunenori: *See*—
Ishizuka, Yutaka; and Shibuya, Tsunenori, 4,511,313, Cl. 417-270.000.

Shigaki, Masanobu, to Kabushiki Kaisha Takuma. Stoker type firing equipment for use with city refuse incinerator. 4,510,873, Cl. 110-289.000.

Shigenobu, Michio: *See*—
Takahashi, Tohru; Tajima, Hatsuo; Shigenobu, Michio; and Washiyama, Shigemichi, 4,511,778, Cl. 219-10.55A.

Shils, Alan J.; and Ianni, John P., Jr., to International Business Machines Corporation. Laser written chip identification method. 4,510,673, Cl. 29-574.000.

Shim, Joosup, to Mobil Oil Corporation. Multifunctional additives. 4,511,481, Cl. 252-32.500.

Shima Idea Center Co., Ltd.: *See*—
Shima, Masahiro, 4,510,775, Cl. 66-77.000.

Shima, Masahiro, to Shima Idea Center Co., Ltd. Flat knitting machine capable of changing stitch density. 4,510,775, Cl. 66-77.000.

Shimada, Satoshi; Murayama, Ken; Kobori, Shigeyuki; and Kawakami, Kanji, to Hitachi, Ltd.; and Hitachi Const. Mach. Company. Pressure sensor with improved semiconductor diaphragm. 4,511,878, Cl. 338-4.000.

Shimadzu Corporation: *See*—
Ideno, Eizo; Fukushi, Shinichi; Tai, Masahiko; Nakazawa, Koji; and Fujita, Toshihito, 4,511,095, Cl. 242-18.00G.
Komoto, Akira, 4,511,883, Cl. 340-347.0AD.
Shimizu, Katsumi: *See*—
Natori, Takeshi; Kobayashi, Yoji; Watanabe, Shigetaka; Shimizu, Katsumi; Matsumura, Ikuei; Namekawa, Yoshihiro; and Miyanaga, Satoshi, 4,510,974, Cl. 138-137.000.
Shimizu, Mutsuhiro: *See*—
Fujimoto, Terunori; Shimizu, Nobuyoshi; Shimizu, Mutsuhiro; Yanagihara, Kazunori; Miyachi, Akio; and Inui, Tsuneo, 4,511,631, Cl. 428-632.000.
Shimizu, Nobuyoshi: *See*—
Fujimoto, Terunori; Shimizu, Nobuyoshi; Shimizu, Mutsuhiro; Yanagihara, Kazunori; Miyachi, Akio; and Inui, Tsuneo, 4,511,631, Cl. 428-632.000.
Shimomura, Hiroshi; and Arai, Tatsuo, to Mitsubishi Kinzoku Kabushiki Kaisha. Insert cutter. 4,511,293, Cl. 407-41.000.
Shimomura, Takatoshi; Fujita, Fumio; and Hirakawa, Manabu, to Sumitomo Chemical Company, Limited. Process for producing semipermeable membrane. 4,511,711, Cl. 528-489.000.
Shimozi, Kozi; and Teshima, Hitoshi, to Toyota Jidosha Kabushiki Kaisha. Catalytic converter secondary air supply pipe support. 4,511,536, Cl. 422-171.000.
Shin, Chung T.: *See*—
Geria, Navin; and Shin, Chung T., 4,511,554, Cl. 424-65.000.
Shin, Kju H., to Ethyl Corporation. Method of preparing adenine. 4,511,716, Cl. 544-277.000.
Shinder, Ilya E.: *See*—
Khramtsov, Alexandr A.; Tsyrkin, Mikhail I.; and Shinder, Ilya E., 4,510,849, Cl. 91-515.000.
Shinohara, Hironobu; Yamahara, Noboru; and Yoshida, Yoshinori, to Japan Synthetic Rubber Co., Ltd. Sulfonic acid compound having cyclopentadiene skeleton and composition comprising same and cement. 4,511,683, Cl. 524-3.000.
Shinohara, Isao, to Matsushita Electric Industrial Co., Ltd. Cassette tape recorder. 4,511,939, Cl. 360-93.000.
Shinohara, Takanobu: *See*—
Konoki, Keizo; Shinohara, Takanobu; Kochi, Ikuyoshi; Shibata, Keiichi; Nishihara, Hisakatsu; Morichika, Toshiaki; Sugitani, Junichi; and Tsuchida, Koji, 4,510,988, Cl. 164-102.000.
Shinoura, Osamu: *See*—
Konno, Ryozo; Sugai, Makio; Kubota, Yuichi; Nishimatsu, Masaharu; Isobe, Yukihiro; Tanaka, Kazushi; and Shinoura, Osamu, 4,511,629, Cl. 428-522.000.
Shionogi & Co., Ltd.: *See*—
Morihara, Kazuyuki; Oka, Tatsushi; and Tsuzuki, Hiroshige, 4,511,505, Cl. 260-112.700.
Tokuyama, Kanji; Nishitani, Yasuhiro; Tanaka, Mamoru; and Nagata, Wataru, 4,511,738, Cl. 568-14.000.
Shiozaki, Tsugio: *See*—
Miyazaki, Naoki; Horiya, Keiichi; Shiozaki, Tsugio; and Takahama, Kazuhide, 4,511,903, Cl. 346-76.0PH.
Shipley Company Inc.: *See*—
Orio, Alfred P.; Levy, Leonard R.; and Gulla, Michael, 4,511,403, Cl. 106-1.220.
Shirahata, Kunikatsu: *See*—
Tomita, Fusao; Tamaoki, Tatsuya; Shirahata, Kunikatsu; Iida, Takao; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,511,560, Cl. 514-27.000.
Shirahata, Ryuji: *See*—
Yanai, Akio; and Shirahata, Ryuji, 4,511,594, Cl. 427-38.000.
Shopsmith, Inc.: *See*—
Bartlett, Robert L.; and McKee, Robert N., 4,510,980, Cl. 144-1.00C.
Shu, Paul: *See*—
Yan, Tsoung Y.; and Shu, Paul, 4,511,459, Cl. 208-127.000.
Shur, Barry D., to University Patents, Inc. Alpha-lactalbumin contraceptive. 4,511,558, Cl. 514-8.000.
Sibert, Frank. Electric stove pipe space heater. 4,511,787, Cl. 219-374.000.
Siedle, Allen R.: *See*—
Palensky, Frederick J.; and Siedle, Allen R., 4,511,715, Cl. 544-225.000.
Siemek, Stanislaw. Hamburger holder. 4,511,039, Cl. 206-525.000.
Siemens Aktiengesellschaft: *See*—
Binz, Reiner; and Pointner, Norbert, 4,512,014, Cl. 370-84.000.
Bromme, Irmfried; Brunner, Reinhold; and Reimer, Heinz, 4,511,993, Cl. 364-900.000.
Eggers, Harald, 4,510,678, Cl. 29-590.000.
Franetzki, Manfred; and Prestele, Karl, 4,511,355, Cl. 604-131.000.
Jacobs, Erwin, 4,511,996, Cl. 365-186.000.
Knott, Joseph; and Kopp, Walter, 4,511,639, Cl. 430-108.000.
Mahrla, Peter, 4,511,912, Cl. 357-36.000.
Moeller, Matthias; and Kausche, Helmold, 4,511,756, Cl. 136-258.000.
Pohlig, Dietmar; and Goepel, Ernst, 4,511,797, Cl. 250-231.0SE.
Reng, Leonhard, 4,511,978, Cl. 364-480.000.
Schwabe, Ulrich; Neppl, Franz; and Hieber, Konrad, 4,510,670, Cl. 29-571.000.
Siemens Corporate Research & Support, Inc.: *See*—
Stockdale, Robert, 4,511,762, Cl. 179-9.000.
Vander Meiden, Orrie J., 4,512,026, Cl. 375-114.000.
Sigmatron Associates: *See*—
Rustomji, Sam H., 4,511,599, Cl. 427-66.000.
Silentnight Holdings PLC: *See*—
Woffendin, Arnold, 4,510,635, Cl. 5-247.000.
Sillion, Bernard: *See*—
Denis, Jacques; Sillion, Bernard; Damin, Bernard; and Leger, Robert, 4,511,369, Cl. 44-62.000.
Simm, Manfred: *See*—
Kuhnel, Werner; Putz, Peter; Simm, Manfred; and Spielau, Paul, 4,511,619, Cl. 428-215.000.
Simpson, Grainger I., Jr.: *See*—
Huerta, Jose L.; Rachui, Roy A.; Roberts, James E.; and Simpson, Grainger I., Jr., 4,511,135, Cl. 271-126.000.
Simpson, James E.: *See*—
Bucksbaum, Arnold M.; and Simpson, James E., 4,511,779, Cl. 219-10.55E.
Simpson, Loran R.: *See*—
Barton, Delmar O.; and Simpson, Loran R., 4,511,130, Cl. 270-54.000.
Sims, Dewey M., Jr., to Northern Telecom Inc. Switch and optical sensor assembly for recorder. 4,511,936, Cl. 360-69.000.
Singer Company, The: *See*—
Fortunato, Alfred R.; Millard, Maurice; and Trzeciak, John R., 4,511,337, Cl. 434-43.000.
Singer, Mark: *See*—
Brenman, Henry S.; Katz, Philip; and Singer, Mark, 4,510,939, Cl. 128-639.000.
Sitte, Helmuth; Cooper, Terry W.; and Kleber, Heinrich, to C. Reichert Optische Werke, AG. Microtome with specimen illumination system. 4,511,224, Cl. 350-523.000.
SKF GmbH: *See*—
Walter, Lothar; and Reith, Walter, 4,511,188, Cl. 308-6.00C.
SKF Industrial Trading & Development Co., B.V.: *See*—
Vermeiren, Karel N.; and Dolfsma, Hendrik, 4,511,837, Cl. 324-61.00R.
SKF Kugellagerfabriken GmbH: *See*—
Glock, Alfred, 4,510,645, Cl. 19-0.250.
Hans, Rudiger; and Brandenstein, Manfred, 4,511,192, Cl. 384-543.000.
Kintzel, Gerhard; and Heilmann, Edmund, 4,510,829, Cl. 82-36.00R.
Winkler, Otmar, 4,511,345, Cl. 464-145.000.
Skidanenko, Constatine V.; and McGibbon, Gregor D., to GTE Communication Systems Corporation. Floating dc current source for a subscriber loop circuit. 4,511,763, Cl. 179-16.0AA.
Skutnik, Bolesh J., to Ensign-Bickford Industries, Inc. Composition having improved optical qualities. 4,511,209, Cl. 350-96.340.
SKW Trostberg AG: *See*—
Vollbrecht, Heinz-Rudiger; Schutz, Erwin; and Sandner, Klaus, 4,511,508, Cl. 426-665.000.
Slater, Glenn L.: *See*—
Fowles, Thomas A.; Slater, Glenn L.; and Winchell, David A., 4,511,529, Cl. 264-515.000.
Slee, Roger H., to AE PLC. Pistons for internal combustion engines. 4,510,895, Cl. 123-48.00B.
Small, Edward A., to British American Bank Note Inc. Plastic identification card having forgery protection with respect to embossed information. 4,511,908, Cl. 346-206.000.
Small, Richard D., Jr.: *See*—
Ors, Jose A.; and Small, Richard D., Jr., 4,511,757, Cl. 174-68.500.
Smiley, Harry; and Blechman, Abraham, to Medical Magnetics, Inc. Integrated oral magnetic osteogenic appliances. 4,511,330, Cl. 433-18.000.
Smith, Craig A., to Xerox Corporation. Time to completion interaction for a copier. 4,511,243, Cl. 355-14.0CU.
Smith, Donald R.: *See*—
Boyd, Mary G.; Smith, Donald R.; Imondi, Peter F.; Hiatt, Norman A.; Bauer, Fritz E.; Anemaet, John M.; and MacKenzie, Alfred K., 4,511,425, Cl. 156-493.000.
Smith, Elizabeth M.; Doll, Ronald J.; and Neustadt, Bernard R., to Schering Corporation. Tricyclic lactams and derivatives useful in increasing cardiac contractility. 4,511,569, Cl. 514-290.000.
Smith, Gary F.: *See*—
Fox, Daniel W.; Peters, Edward N.; and Smith, Gary F., 4,511,693, Cl. 525-67.000.
Smith, Gerald Z., Jr.: *See*—
Smith, R. Scott; and Smith, Gerald Z., Jr., 4,511,753, Cl. 585-856.000.
Smith International, Inc.: *See*—
Geczy, Bela A., 4,511,193, Cl. 384-611.000.
Smith, Michael J.: *See*—
Park, George; Smith, Michael J.; and Carrington, Harry, 4,511,194, Cl. 312-12.000.
Smith, R. Scott; and Smith, Gerald Z., Jr., to Ethyl Corporation. Selective removal of vinylidene olefin from olefin mixtures. 4,511,753, Cl. 585-856.000.
Smith, Richard: *See*—
Alexander, Edward N.; and Smith, Richard, 4,511,463, Cl. 209-166.000.
Smith, Ronald L.: *See*—
Ingermann, Donald E.; Smith, Ronald L.; Knoll, Jimmie L.; Caffrey, Stephen F.; Barsi, Endre; and Dechant, Joseph C., 4,510,642, Cl. 15-231.000.
Smith, Stanley W.: *See*—
Vogel, Wolfgang M.; and Smith, Stanley W., 4,511,636, Cl. 429-41.000.
SMS-Schloemann Siemag AG: *See*—
Rommen, Hans; and Frosch, Hans, 4,510,783, Cl. 72-200.000.

Snyder, Daniel S.; and Benincasa, Timothy C., to Imperial Clevite Inc. Radio circuit tuned by adjustably deforming an inductance coil. 4,511,869, Cl. 334-20.000.
Snyder General Corporation: *See—*
Hoeffken, Russell W., 4,510,660, Cl. 29-157.30D.
Societe d' Assistance Technique pour Produits Nestle S.A.: *See—*
Padly, Yvan; and Borgeaud, Roger, 4,511,589, Cl. 426-521.000.
Societe Generale pour les Techniques Nouvelles S.G.N.: *See—*
Guilloteau, Rene , 4,510,832, Cl. 83-168.000.
Guilloteau, Rene , 4,511,500, Cl. 252-633.000.
Societe Lyonnaise des Applications Catalytiques: *See—*
Lacroix, Alain, 4,511,326, Cl. 431-53.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Caye, Paul D.; Jamain, Patrice C.; and Weisser, Bernard G., 4,511,190, Cl. 308-10.000.
Societe Nouvelle Auxim (Societe Anonyme): *See—*
Seguenot, Gabriel, 4,511,150, Cl. 277-12.000.
Societe Nouvelle des Etablissements Dervaux: *See—*
Saint-Prix, Robert; and Montmartin, Henri, 4,511,280, Cl. 403-274.000.
Societe pour l'Etude et la Fabrication de Circuits: *See—*
Brice, Jean-Michel, 4,512,029, Cl. 377-33.000.
Soda Aromatic Company, Limited: *See—*
Matumoto, Yuuichi, 4,511,496, Cl. 252-522.00A.
Soderstrom, Sigvard V., to Aktiebolaget Electrolux. Activating apparatus in a liquid conveying system operated by vacuum, preferably a so-called vacuum sewage system. 4,511,117, Cl. 251-73.000.
Softal GmbH, Firma: *See—*
Kuhlmann, Heinz; and Prinz, Eckhard, 4,511,419, Cl. 156-272.600.
Sohio Alternate Energy Development Company: *See—*
Mark, Seymour, 4,511,365, Cl. 44-51'.000.
Sohnemann, Richard, to Continental Gummi-Werke Aktiengesellschaft. Rubber mixture for direct bonding to metal surfaces. 4,511,697, Cl. 525-139.000.
Sokorai, Agnes: *See—*
Budai, Zoltan; Kis-Tamas, Attila; Mezei, Tibor; Lay, Aranka; Vigh, Zoltan; and Sokorai, Agnes, 4,511,737, Cl. 564-257.000.
Solarex Corporation: *See—*
Leas, James M., 4,511,600, Cl. 427-75.000.
Somerville, William M., to Northern Engineering Industries plc. Electrical generator control system. 4,511,807, Cl. 290-44.000.
Son, Tae W.: *See—*
Yoon, Han S.; and Son, Tae W., 4,511,623, Cl. 428-359.000.
Sone, Masazumi: *See—*
Ishikawa, Yasuki; Endo, Hiroshi; Sone, Masazumi; and Imai, Iwao, 4,510,915, Cl. 123-620.000.
Sonics Research Corporation: *See—*
Colomb, Denis G., 4,511,928, Cl. 358-280.000.
Sony Corporation: *See—*
Guerrero, Manuel A., 4,511,937, Cl. 360-72.100.
Hamada, Osamu, 4,511,966, Cl. 364-200.000.
Ida, Mitsuru, 4,511,941, Cl. 360-105.000.
Kimura, Shuichi; and Katsuyama, Akira, 4,512,003, Cl. 369-45.000.
Nonaka, Chiaki, 4,512,004, Cl. 369-45.000.
Ohira, Takao; Okihara, Daijiro; and Niiro, Makoto, 4,511,934, Cl. 360-55.000.
Saito, Etsuro, 4,511,944, Cl. 360-133.000.
Soroi, Kazunori: *See—*
Nagato, Yoshio; and Soroi, Kazunori, 4,511,665, Cl. 501-96.000.
Sorrentino, Anthony A. Window-type air conditioner mounting assembly. 4,510,852, Cl. 98-94.200.
Soum, Rene P. Prestressed cable anchorage system. 4,510,723, Cl. 52-223.00R.
Southern Research Institute: *See—*
Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,511,721, Cl. 546-308.000.
Sovonics Solar Systems: *See—*
Izu, Masatsugu; and Cannella, Vincent D., 4,510,674, Cl. 29-574.000.
Izu, Masatsugu; and Cannella, Vincent D., 4,510,675, Cl. 29-574.000.
Span, Francis J.; Boland, Aloysius T. M.; and van Laarhoven, Albertus J. A. J., to U.S. Philips Corporation. Clamping mechanism. 4,511,275, Cl. 403-33.000.
Spang Industries Inc.: *See—*
Olmsted, Robert W.; and Huth, Joseph F., III, 4,511,872, Cl. 336-83.000.
Spatz, Gunter: *See—*
Brandes, Carlos E.; and Spatz, Gunter, 4,511,053, Cl. 215-252.000.
Spector, George: *See—*
Beasley, Gary; and Spector, George, 4,510,697, Cl. 34-1.000.
Speedco, Incorporated: *See—*
Estes, Donald C., 4,510,883, Cl. 118-305.000.
Spencer, Joseph, to Cardiac Recorders Limited. Cardiac defibrillator. 4,510,935, Cl. 128-419.00D.
Sperry Corporation: *See—*
Campbell, Willis R.; and Blanshine, Allison W., 4,510,861, Cl. 100-88.000.
Decoene, Frans J. G. C.; Strubbe, Gilbert J. L.; and Todd, Robert R., 4,510,946, Cl. 130-27.00T.
Dekeyzer, Marcel A., 4,510,948, Cl. 130-27.00R.
Devriese, Thierry E. G., 4,510,947, Cl. 130-27.00B.
Fedde, George A.; and Kirk, Kenneth H., 4,510,683, Cl. 29-701.000.
Grothe, Steven P., 4,511,892, Cl. 340-739.000.
Witalka, Jerome J.; Buettner, Howard L.; and Ellsworth, James G., 4,511,967, Cl. 364-200.000.
Witdoek, Daniel C.; and Dhont, Andre G. J., 4,511,348, Cl. 474-109.000.
Spiegel, Martin A.; and Roberts, Franklin D., to Mr. Gasket Company. Steel wheel with decorative cover. 4,511,183, Cl. 301-37.00S.
Spielau, Paul: *See—*
Kuhnel, Werner; Putz, Peter; Simm, Manfred; and Spielau, Paul, 4,511,619, Cl. 428-215.000.
Spinnett, Raymond G., to KDI American Products, Inc. Anti-backflow valve for therapy tubs and the like. 4,510,967, Cl. 137-389.000.
Spirk, John W., Jr.; and Nottingham, John R. Animated coin sorting bank. 4,511,341, Cl. 446-9.000.
SSP Pumps Limited: *See—*
Ellis, Bryan E., 4,511,316, Cl. 418-150.000.
Stafford, Rita A.: *See—*
Garley, Anthony M.; and Stafford, Rita A., 4,510,876, Cl. 112-262.100.
Stahl, G. Allan: *See—*
Horton, Robert L.; and Stahl, G. Allan, 4,511,677, Cl. 521-28.000.
Stahly, Barbara C.: *See—*
Stahly, G. Patrick; and Stahly, Barbara C., 4,511,729, Cl. 560-020.000.
Stahly, G. Patrick; and Stahly, Barbara C., to Ethyl Corporation. Nucleophilic substitution process. 4,511,729, Cl. 560-020.000.
Standard Oil Company, The: *See—*
Attig, T. G.; and Grasselli, R. K., 4,511,548, Cl. 423-376.000.
Bonny, Alan, 4,511,454, Cl. 208-10.000.
Standard Oil Company (Indiana): *See—*
Fields, Ellis K., 4,511,730, Cl. 560-033.000.
Vasalos, Iacovos, 4,511,434, Cl. 202-99.000.
Standley, Paul M., to Dayco Corporation. Endless power transmission belt construction and method and apparatus for making the same. 4,511,521, Cl. 264-24.000.
Stanislowski, Anna G.; and Wiersema, Richard J., to Clorox Company, The. Cooperative enzymes comprising alkaline or mixtures of alkaline and neutral proteases without stabilizers. 4,511,490, Cl. 252-174.120.
Stanuch, Edward S., to Federal Signal Corporation. Twin oscillating light. 4,511,880, Cl. 340-84.000.
Starmuehler, Erwin: *See—*
Schweiger, Erwin; Starmuehler, Erwin; and Temmesfeld, Axel, 4,510,893, Cl. 123-41.020.
Stauffer Chemical Co.: *See—*
Felix, Raymond A., 4,511,394, Cl. 71-105.000.
Steer, John E., to Allied Corporation. Master cylinder. 4,510,753, Cl. 60-578.000.
Stefani, Giancarlo: *See—*
Suciu, George D.; Stefani, Giancarlo; and Fumagalli, Carlo, 4,511,670, Cl. 502-209.000.
Steigerwald, Carl J., to Kendall Company, The. Liquid drainage system with a guidable valve element. 4,511,357, Cl. 604-323.000.
Stein, Volkhard: *See—*
Eisele, Hermann; and Stein, Volkhard, 4,510,908, Cl. 123-449.000.
Steiner, Eginhard: *See—*
Boger, Manfred; Ehrenfreund, Josef; Martin, Pierre; and Steiner, Eginhard, 4,511,571, Cl. 514-351.000.
Steininger, David A., to Electric Power Research Institute, Inc. Method of cleaning corroded metal articles by induction heating. 4,511,407, Cl. 134-1.000.
Steilram GmbH: *See—*
Grunsky, Manfred; Susamuth, Reiner; and Ischen, Gunter, 4,511,294, Cl. 408-232.000.
Stensland, Leif: *See—*
Thylen, Lars; Stensland, Leif; and Arvidsson, Gunnar, 4,511,206, Cl. 350-96.110.
Stephens, Howard P.: *See—*
Dosch, Robert G.; Stephens, Howard P.; and Stohl, Frances V., 4,511,455, Cl. 208-10.000.
Stephenson, David J., to Johnson Matthey Public Limited Company. Recovery of precious metal. 4,511,539, Cl. 422-311.000.
Sterling, Robert E., to Medical Research Associates, Ltd. Hydrocarbon block copolymer with dispersed polysiloxane. 4,511,354, Cl. 604-98.000.
Stern, Allen M.: *See—*
Godfrey, Steven W.; Stern, Allen M.; and MacGregor, Fran W., 4,511,111, Cl. 248-459.000.
Stern, Howard K.: *See—*
Di Matteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 4,511,252, Cl. 356-375.000.
Sternberg, Walter; Schreyer, Fritz; and Ruth, Ursula, to NUKEM GmbH. Method for distinguishing between interfering signals and signals indicating defects of workpieces during ultrasonic testing. 4,510,811, Cl. 73-611.000.
Sterner, Carl L. Pothole patcher. 4,511,284, Cl. 404-111.000.
Stewart, David B.: *See—*
Preston, Edward G.; and Stewart, David B., 4,510,949, Cl. 131-109.00R.
Stockdale, Robert, to Siemens Corporate Research & Support, Inc. Overload detection and control system for a telecommunications exchange. 4,511,762, Cl. 179-9.000.
Stohl, Frances V.: *See—*
Dosch, Robert G.; Stephens, Howard P.; and Stohl, Frances V., 4,511,455, Cl. 208-10.000.
Stol, Israel, to Invocas, Inc. Anchor bolt with mechanical keys deployed by internal pressurization. 4,511,296, Cl. 411-20.000.
Stone, Carroll E.; and Seifert, William F. C., to American Engineering Group International, Inc. Process for treating overspray gas from

glass coating operation with metal recovery. 4,511,545, Cl. 423-240.000.

Stork Brabant B.V.: *See—*
Blaak, Cornelis; and van Mondfrans, Gerardus H., 4,510,863, Cl. 101-119.000.

Stork PMT B.V.: *See—*
van Mil, Martinus P. G., 4,510,886, Cl. 119-82.000.

Strait, Richard T.: *See—*
Sabatino, Anthony; Schaumburg, Edward G.; Recht, Peter A.; Olszewski, Douglas J.; and Strait, Richard T., 4,510,682, Cl. 29-623.100.

Strangward, William J., to Langenau Manufacturing Company, The. Method and apparatus of making double reverse corrugated material. 4,510,786, Cl. 72-326.000.

Strautz, Michael G.: *See—*
Baker, Paul A.; and Strautz, Michael G., 4,511,201, Cl. 339-75.0MP.

Street, Norman: *See—*
Henderson, Deborah; and Street, Norman, 4,510,931, Cl. 128-202.280.

Strohschein, Rudy. Non-flooding distilling column. 4,511,435, Cl. 202-158.000.

Strombecker Corporation: *See—*
Ehrlich, Joseph R., 4,511,497, Cl. 252-542.000.

Stromvall, Sten K.: *See—*
Kohler, Hans O.; and Stromvall, Sten K., 4,511,917, Cl. 358-84.000.

Strubbe, Gilbert J. I.: *See—*
Decoene, Frans J. G. C.; Strubbe, Gilbert J. I.; and Todd, Robert R., 4,510,946, Cl. 130-27.00T.

Stuart, James G.: *See—*
Bucha, Robert M.; Dzermejko, Albert J.; and Stuart, James G., 4,511,264, Cl. 374-135.000.

Studtmann, George H., to Borg-Warner Corporation. Control and stabilizing system for damperless synchronous motor. 4,511,834, Cl. 318-700.000.

Studtmann, George H., to Borg-Warner Corporation. Voltage-controlled, inverter-motor system. 4,511,835, Cl. 318-700.000.

Stutz, Hansruedi, to Loepfe Brothers Limited. Electronic scanner for monitoring running threads at a multitude of locations in a textile machine. 4,512,028, Cl. 377-16.000.

Stutz, Hansruedi: *See—*
Glockner, Rolf; and Stutz, Hansruedi, 4,511,253, Cl. 356-385.000.

Suciu, George D.; Stefani, Giancarlo; and Fumagalli, Carlo, to Lummus Company, The. Catalysts containing mixed oxides of vanadium, phosphorus, and aluminum and/or boron. 4,511,670, Cl. 502-209.000.

Suda, Toshi: *See—*
Ninomiya, Masakazu; Suda, Toshi; Omori, Norio; Akiyama, Susumu; and Fukaya, Hiroyasu, 4,510,910, Cl. 123-486.000.

Sugai, Kazuyoshi: *See—*
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Sugai, Kazuyoshi, 4,511,816, Cl. 310-313.00A.

Sugai, Makio: *See—*
Konno, Ryozo; Sugai, Makio; Kubota, Yuichi; Nishimatsu, Masaharu; Isobe, Yukihiru; Tanaka, Kazushi; and Shinoura, Osamu, 4,511,629, Cl. 428-522.000.

Sugitani, Junichi: *See—*
Konoki, Keizo; Shinohara, Takanobu; Kochi, Ikuyoshi; Shibata, Keiichi; Nishihara, Hisakatsu; Morichika, Toshiaki; Sugitani, Junichi; and Tsuchida, Koji, 4,510,988, Cl. 164-102.000.

Sugiura, Yasuyuki: *See—*
Morinaga, Shigeki; Miyashita, Kunio; and Sugiura, Yasuyuki, 4,511,827, Cl. 318-254.000.

Sugiyama, Shizuo: *See—*
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,511,990, Cl. 364-748.000.

Sukegawa, Ken: *See—*
Higashi, Kensaku; Yano, Haruhiko; Sato, Hirotsugu; Sukegawa, Ken; and Ooba, Yuji, 4,511,642, Cl. 430-161.000.

Sumal, Jaihind S., to Robert Bosch GmbH. Method for measuring air flow. 4,510,795, Cl. 73-118.000.

Sumino, Yoichi; and Enjoji, Susumu, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasound diagnostic apparatus. 4,511,984, Cl. 364-415.000.

Sumitani, Toshihiko; and Komeda, Kenichiro, to Sharp Kabushiki Kaisha. Game calculating apparatus. 4,511,138, Cl. 273-1.00E.

Sumitomo Chemical Co., Ltd.: *See—*
Ishii, Tamaki; Yachigo, Shinichi; and Takahashi, Yukoh, 4,511,491, Cl. 252-404.000.
Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, 4,511,507, Cl. 534-629.000.
Minai, Masayoshi; and Katsura, Tadashi, 4,511,655, Cl. 435-149.000.
Mori, Kenji; and Uematsu, Tamon, 4,511,726, Cl. 549-283.000.
Ohsumi, Tadashi; Inoue, Satoru; and Maeda, Kiyoto, 4,511,581, Cl. 514-617.000.
Shimomura, Takatoshi; Fujita, Fumio; and Hirakawa, Manabu, 4,511,711, Cl. 528-489.000.

Sumitomo Electric Industries, Ltd.: *See—*
Kawaguchi, Munetaka; Nakabayashi, Hirohiko; and Miyake, Masayoshi, 4,511,624, Cl. 428-379.000.

Sumitomo Heavy Industries, Ltd.: *See—*
Okawa, Masao, 4,511,029, Cl. 198-621.000.

Sumitomo Metal Industries, Ltd.: *See—*
Hayashi, Chihiro; and Nakasuji, Kazuyuki, 4,510,787, Cl. 72-368.000.

Sunbeam Plastics Corporation: *See—*
Bush, Randall G., 4,511,032, Cl. 206-1.500.

Sundstrand Corporation: *See—*
Aleem, Mohd A.; Lobsinger, James L.; and Wefel, Jerry D., 4,510,679, Cl. 29-598.000.

Sundstrand Data Control, Inc.: *See—*
Peters, Rex B., 4,510,802, Cl. 73-505.000.

Sunsweet Growers of California: *See—*
Walsh, Richard J.; and Gyles, Darrell D., 4,511,046, Cl. 209-539.000.

Sussmuth, Reiner: *See—*
Grunsky, Manfred; Sussmuth, Reiner; and Ischen, Gunter, 4,511,294, Cl. 408-232.000.

Susumu Matsumura and Mitsubishi Denki Kabushiki Kaisha: *See—*
Matsumura, Susumu; and Imataki, Mitsumasa, 4,511,957, Cl. 363-54.000.

Sutherland, Jack L.: *See—*
Motiwala, M. Arif; and Sutherland, Jack L., 4,511,862, Cl. 332-16.00R.

Sutter, Jean: *See—*
Peroux, Bernard; Santy, Jean; and Sutter, Jean, 4,510,965, Cl. 137-375.000.

Suzuki, Hiroshi: *See—*
Makino, Daisuke; Sato, Hidetaka; Suzuki, Hiroshi; Uchimura, Shun-ichiro; and Suzuki, Hiroshi, 4,511,705, Cl. 528-26.000.
Makino, Daisuke; Sato, Hidetaka; Suzuki, Hiroshi; Uchimura, Shun-ichiro; and Suzuki, Hiroshi, 4,511,705, Cl. 528-26.000.

Suzuki, Koji; Kuroda, Kouki; and Nagahira, Jyoji, to Canon Kabushiki Kaisha. Electrostatic recording apparatus. 4,511,240, Cl. 355-14.00R.

Suzuki, Kunio: *See—*
Kasuga, Takuzo; Takahashi, Katsuhiko; and Suzuki, Kunio, 4,511,708, Cl. 528-274.000.

Suzuki, Nobuhiko, to Diesel Kiki Co., Ltd. Control method for air conditioning systems for vehicles. 4,510,764, Cl. 62-133.000.

Suzuki, Satoshi: *See—*
Nishikawa, Hisashi; Suzuki, Satoshi; Hirata, Masanobu; Sakamoto, Koichiro; Fujisawa, Ikuo; and Takeno, Shozo, 4,511,877, Cl. 338-2.000.

Suzuki, Yoshihisa: *See—*
Mori, Mitsuo; Suzuki, Yoshihisa; Muramatsu, Shigeru; and Takasu, Sigeru, 4,510,648, Cl. 19-266.000.

Svendsen, Robert A., to Marine Construction & Design Co. Deepwater king crab pot line hauler. 4,511,122, Cl. 254-332.000.

Swedo, Raymond J.; and House, David W., to UOP Inc. Electrically conducting aromatic azopolymers and method of preparation. 4,511,492, Cl. 252-500.000.

Swenson, Paul F.: *See—*
Hise, Ralph E.; and Swenson, Paul F., 4,510,756, Cl. 60-659.000.

Swessel, John A., Jr.: *See—*
Link, Donald A.; Swessel, John A., Jr.; and Theisen, Peter J., 4,511,772, Cl. 200-144.00R.

Swidwa, Kenneth J.; Hornak, Leonard P.; and Kowalski, Edward F., to Westinghouse Electric Corp. Transfer of nuclear reactor component assemblies. 4,511,531, Cl. 376-262.000.

Swiss Aluminium Ltd.: *See—*
Kugler, Tibor, 4,511,398, Cl. 75-63.000.
Molnar, Sandor, 4,511,449, Cl. 204-243.00R.

SWS Silicones Corporation: *See—*
Martin, Eugene R., 4,511,727, Cl. 556-418.000.

Syring, Ewald. Method and template for applying relief plastering on a wall surface. 4,510,729, Cl. 52-741.000.

Szekeres, Gabor L.: *See—*
Klein, Howard J.; and Szekeres, Gabor L., 4,511,052, Cl. 215-230.000.

Szendrei, Kalman; Minker, Emil; Rozsa, Zsuzsanna; Koch, Lehel; and Wolf, Lajos, to Kozponti Valto-es Hitelbank Rt. InnovacioAlap. Biologically active polysaccharide concentrates and process for production of preparates containing such substances. 4,511,559, Cl. 514-54.000.

Szoke, Abraham: *See—*
Schlitt, Leland G.; and Szoke, Abraham, 4,511,850, Cl. 330-4.300.

Szymaszek, Jan W.: *See—*
Heft, Eldon B.; Huseby, Irvin C.; and Szymaszek, Jan W., 4,511,773, Cl. 200-144.00C.

Ta-Ming Wu, Allen: *See—*
Phelps, Andrew E.; and Ta-Ming Wu, Allen, 4,512,018, Cl. 370-112.000.

Tabata, Kuniaki: *See—*
Machida, Tetsuo; Tsuhara, Susumu; Tabata, Kuniaki; and Okada, Yasuyuki, 4,511,962, Cl. 364-200.000.

Tabata, Masaaki; and Miyabayashi, Katsuyuki, to Toyota Jidosha Kabushiki Kaisha. Vehicle door handle sealing system. 4,511,172, Cl. 296-146.000.

Tada, Kuniyuki: *See—*
Iwayama, Kazuyoshi; Kamano, Takao; Tada, Kuniyuki; and Inoue, Takehisa, 4,511,547, Cl. 423-329.000.

Taguchi, Masahiro; Kuwakado, Satosi; and Tsuge, Noboru, to Nippon Soken, Inc. Exhaust gas purifier for a diesel engine. 4,510,749, Cl. 60-286.000.

Taguchi, Masahiro: *See—*
Tsuge, Noboru; Taguchi, Masahiro; and Kuwakado, Satosi, 4,511,097, Cl. 242-55.000.

Tai, Masahiko: *See—*
Ideno, Eizo; Fukushi, Shinichi; Tai, Masahiko; Nakazawa, Koji; and Fujita, Toshihito, 4,511,095, Cl. 242-18.00G.

Taiyo Sanso Kabushiki Kaisha: *See*—
Kawaguchi, Takehiko, 4,511,167, Cl. 294-28.000.
Tajima, Hatsuo: *See*—
Takahashi, Tohru; Tajima, Hatsuo; Shigenobu, Michio; and Washiyama, Shigemichi, 4,511,778, Cl. 219-10.55A.
Takagi, Kenji: *See*—
Miyamori, Hideaki; Takagi, Kenji; Sato, Shigeru; Takahashi, Fujio; and Ozawa, Mikio, 4,511,784, Cl. 219-123.000.
Takagi, Syoji, to Tokyo Shibaura Denki Kabushiki Kaisha. Coffee making apparatus. 4,510,853, Cl. 99-286.000.
Takahama, Kazuhide: *See*—
Miyazaki, Naoki; Horiya, Keiichi; Shiozaki, Tsugio; and Takahama, Kazuhide, 4,511,903, Cl. 346-76.0PH.
Takahashi, Fujio: *See*—
Miyamori, Hideaki; Takagi, Kenji; Sato, Shigeru; Takahashi, Fujio; and Ozawa, Mikio, 4,511,784, Cl. 219-123.000.
Takahashi, Katsuhiko: *See*—
Kasuga, Takuzo; Takahashi, Katsuhiko; and Suzuki, Kunio, 4,511,708, Cl. 528-274.000.
Takahashi, Kazue; Okuna, Kenzi; Nakajima, Isao; Harada, Mineo; and Kako, Yutaka, to Hitachi, Ltd. Cancel type printing head. 4,511,269, Cl. 400-124.000.
Takahashi, Kihei, to Yoshida Kogyo K. K. Clamping unit. 4,510,658, Cl. 29-33.200.
Takahashi, Motohiko: *See*—
Nakane, Masao; Takahashi, Motohiko; and Ogawa, Takaki, 4,511,974, Cl. 364-463.000.
Takahashi, Osamu: *See*—
Okamura, Hisashi; Sakaguchi, Shinji; Takahashi, Osamu; and Murai, Ashita, 4,511,644, Cl. 430-219.000.
Takahashi, Tetsuro: *See*—
Ishida, Kenichi; and Takahashi, Tetsuro, 4,510,668, Cl. 29-561.000.
Takahashi, Tohru; Tajima, Hatsuo; Shigenobu, Michio; and Washiyama, Shigemichi, to Canon Kabushiki Kaisha. Image fixing device utilizing a high frequency wave. 4,511,778, Cl. 219-10.55A.
Takahashi, Tomohiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Recording apparatus. 4,511,904, Cl. 346-134.000.
Takahashi, Yoshio: *See*—
Umezawa, Hamao; Oono, Masaji; Ishihama, Hiroshi; Kyotani, Yoshinori; and Takahashi, Yoshio, 4,511,509, Cl. 260-239.00A.
Takahashi, Yukoh: *See*—
Ishii, Tamaki; Yachigo, Shinichi; and Takahashi, Yukoh, 4,511,491, Cl. 252-404.000.
Takai, Kazuki: *See*—
Yamaguchi, Katsumi; Takai, Kazuki; and Okada, Hitoshi, 4,511,940, Cl. 360-96.600.
Takamatsu, Toshiaki; and Nonomura, Keisaku, to Sharp Kabushiki Kaisha. Curved electrode pattern in a liquid crystal color display cell. 4,511,217, Cl. 350-336.000.
Takasu, Sigeru: *See*—
Mori, Mitsuo; Suzuki, Yoshihisa; Muramatsu, Shigeru; and Takasu, Sigeru, 4,510,648, Cl. 19-266.000.
Takayama, Seizo, to UBE Industries, Inc. Vent-type plastication molding machine. 4,511,319, Cl. 425-145.000.
Takeichi, Hideo: *See*—
Tanuma, Itsuo; Takeichi, Hideo; Fukuura, Yukio; Ohyachi, Tomio; and Naito, Kazuo, 4,511,627, Cl. 428-429.000.
Takemae, Yoshihiro: *See*—
Nozaki, Shigeki; Takemae, Yoshihiro; and Nakano, Tomio, 4,511,997, Cl. 365-189.000.
Takenaga, Hideo: *See*—
Imai, Yougo; and Takenaga, Hideo, 4,511,935, Cl. 360-66.000.
Takeno, Shozo: *See*—
Nishikawa, Hisashi; Suzuki, Satoshi; Hirata, Masanobu; Sakamoto, Koichiro; Fujisawa, Ikuo; and Takeno, Shozo, 4,511,877, Cl. 338-2.000.
Takeshita, Akira: *See*—
Kayane, Yutaka; Omura, Takashi; Otake, Katsumasa; and Takeshita, Akira, 4,511,507, Cl. 534-629.000.
Takeuchi, Yo: *See*—
Toma, Ken; Iida, Masanao; and Takeuchi, Yo, 4,511,632, Cl. 428-654.000.
Tallon, Jacques: *See*—
Morel, Jacques; and Tallon, Jacques, 4,510,792, Cl. 73-40.700.
Tamai, Yasuo: *See*—
Anonuma, Masashi; Tamai, Yasuo; Sato, Tsunehiko; Funabashi, Shinichi; and Ogawa, Hiroshi, 4,511,484, Cl. 252-62.540.
Tamaoki, Eiki: *See*—
Kouchi, Takashi; and Tamaoki, Eiki, 4,511,826, Cl. 318-98.000.
Tamaoki, Tatsuya: *See*—
Tomita, Fusao; Tamaoki, Tatsuya; Shirahata, Kunikatsu; Iida, Takao; Morimoto, Makoto; and Fujimoto, Kazuhisa, 4,511,560, Cl. 514-27.000.
Tamoto, Koji: *See*—
Koike, Mitsuru; Kobayashi, Kesanao; Toyama, Tadao; Misu, Hiroshi; Tamoto, Koji; and Iwasaki, Masayuki, 4,511,645, Cl. 430-276.000.
Tamura, Toshifumi: *See*—
Ozeki, Takeshi; and Tamura, Toshifumi, 4,511,208, Cl. 350-96.160.
Tanaka, Hiroyuki: *See*—
Tokutake, Kunihiko; Mizokami, Nobuo; and Tanaka, Hiroyuki, 4,510,807, Cl. 73-432.00R.
Tanaka, Kazushi: *See*—
Konno, Ryozo; Sugai, Makio; Kubota, Yuichi; Nishimatsu, Masaharu; Isobe, Yukihiro; Tanaka, Kazushi; and Shinoura, Osamu, 4,511,629, Cl. 428-522.000.
Tanaka, Mamoru: *See*—
Tokuyama, Kanji; Nishitani, Yasuhiro; Tanaka, Mamoru; and Nagata, Wataru, 4,511,738, Cl. 568-14.000.
Tanaka, Seiitch; and Inoue, Akitoshi, to Anritsu Electric Company Limited. Plating apparatus. 4,511,448, Cl. 204-198.000.
Tanaka, Toru; Gohko, Nobuaki; Kishiro, Osamu; and Murakami, Atsushi, to Mitsubishi Chemical Industries Ltd. Process for producing polyolefin. 4,511,704, Cl. 526-125.000.
Tanaka, Yasushi: *See*—
Watanabe, Hiroyuki; and Tanaka, Yasushi, 4,511,176, Cl. 296-204.000.
Tanaka, Yoshiaki: *See*—
Inami, Mamoru; Tanaka, Yoshiaki; and Otsuki, Zenju, 4,510,840, Cl. 84-477.00R.
Tanaka, Yoshiharu, to Mansei Kogyo Kabushiki Kaisha. Focussing lens operating device. 4,511,212, Cl. 350-255.000.
Tanaka, Yoshikazu: *See*—
Kano , Yoshiharu; Fujisawa, Makoto; Nojiri, Shoji; and Tanaka, Yoshikazu, 4,512,015, Cl. 370-110.100.
Yamamuro, Sigeaki; Hirano, Hiroyuki; Morimoto, Yoshiro; and Tanaka, Yoshikazu, 4,510,822, Cl. 74-733.000.
Taniguchi, Keishi; and Iiyama, Kiyotaka. Thermosensitive recording material. 4,511,910, Cl. 346-216.000.
Tanuma, Itsuo; Takeichi, Hideo; Fukuura, Yukio; Ohyachi, Tomio; and Naito, Kazuo, to Bridgestone Tire Company Limited. Sandwich glasses. 4,511,627, Cl. 428-429.000.
Tarumi, Noriyoshi: *See*—
Seimiya, Ryubun; Tarumi, Noriyoshi; Kokiso, Masakazu; and Tsuchiya, Hiroshi, 4,511,622, Cl. 428-323.000.
Tasnadi, Marta: *See*—
Gorog, Katalin; Dudar, Erzebet; Gardi, Ivan; Kocsis, Maria; Gaal, Sandor; and Tasnadi, Marta, 4,511,714, Cl. 548-215.000.
Tatham, Edward J.; Kravits, Richard; Clymer, John C.; and Hoffman, Carvel D., to Bethlehem Steel Corporation. Radiation scanning and measuring device. 4,511,801, Cl. 250-394.000.
Tatum, O. Hilt, Jr. Dental implant. 4,511,335, Cl. 433-173.000.
Taylor, Gene W.; and Roybal, Herman E., to United States of America, Energy. Fluorinated diamond particles bonded in a filled fluorocarbon resin matrix. 4,511,373, Cl. 51-298.000.
Taylor, Mark P., to Corning Glass Works. Fiber-reinforced composites. 4,511,663, Cl. 501-4.000.
TDK Corporation: *See*—
Nunokawa, Eiichi; Ishida, Toshihiko; and Ohira, Yasuo, 4,511,099, Cl. 242-71.800.
TDK Electronics Co., Ltd.: *See*—
Konno, Ryozo; Sugai, Makio; Kubota, Yuichi; Nishimatsu, Masaharu; Isobe, Yukihiro; Tanaka, Kazushi; and Shinoura, Osamu, 4,511,629, Cl. 428-522.000.
Team Cruiser Conversion Co., Inc.: *See*—
Gellenbeck, Thomas C., 4,511,175, Cl. 296-190.000.
Teege, Gernot: *See*—
Nissen, Axel; Horner, Michael; Horn, Dieter; Lueddecke, Erik; and Teege, Gernot, 4,511,685, Cl. 524-110.000.
Teijin Limited: *See*—
Ishizuka, Seiichi; and Kubo, Junji, 4,511,564, Cl. 514-167.000.
Tektronix, Inc.: *See*—
Koller, Thomas J., 4,511,235, Cl. 355-1.000.
Teldec Telefunken-Decca-Schallplatten GmbH: *See*—
Knothe, Herbert; and Roschmann, Klaus, 4,512,007, Cl. 369-127.000.
Teledyne Industries, Inc.: *See*—
Schuler, John G.; and Lingenfelter, Lowell R., 4,511,196, Cl. 339-14.00R.
Temmesfeld, Axel: *See*—
Schweiger, Erwin; Starmuehler, Erwin; and Temmesfeld, Axel, 4,510,893, Cl. 123-41.020.
Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., to Southern Research Institute. Intermediate for preparing antifungal 1,2-dihydropyrido[3,4-b]-pyrazines. 4,511,721, Cl. 546-308.000.
Tempo, Inc.: *See*—
Pote, Robert L., Jr., 4,511,142, Cl. 273-87.400.
Tench, Orren K., Jr., to Canberra Industries, Inc. Convertible cryostat. 4,510,758, Cl. 62-45.000.
Teng, Yu-Ling; and Mayernik, Richard, to Kollmorgen Technologies Corporation. Method for depositing a metal on a surface. 4,511,597, Cl. 427-53.100.
Tennant, William A.: *See*—
Kudert, Frederick G.; Latreille, Maurice G.; and Tennant, William A., 4,511,528, Cl. 264-328.800.
Tennessee Valley Authority: *See*—
Jones, Thomas M.; and Kendrick, Lucian A., Jr., 4,511,388, Cl. 71-34.000.
Teraoka, Masanori, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 4,511,802, Cl. 250-484.100.
Termine, Enrico J.; and Ginter, Sally P., to Dow Chemical Company, The. Flame retardant for use in rigid polyurethane foams. 4,511,688, Cl. 524-380.000.
Teshima, Hitoshi: *See*—
Shimozi, Kozi; and Teshima, Hitoshi, 4,511,536, Cl. 422-171.000.
Tetra Pak International AB: *See*—
Lothman, Stig A., 4,510,732, Cl. 53-168.000.
Rauser, Jan A. I.; and Cetrelli, Renato, 4,511,078, Cl. 229-17.00R.
Texaco Inc.: *See*—
Alexander, David C.; and Knifton, John F., 4,511,740, Cl. 568-454.000.

Mims, Donald S., 4,511,000, Cl. 166-303.000.

Texas Instruments Incorporated: *See—*
Andresen, Bernhard H., 4,511,234, Cl. 354-428.000.
Caldwell, David; and Agrawal, Mahendra P., 4,511,987, Cl. 364-715.000.
Gotz, Laslo, 4,511,923, Cl. 358-191.100.

Texas Recreation Corporation: *See—*
Scheurer, Stephen M., 4,510,665, Cl. 29-460.000.

Theeuwes, Felix, to ALZA Corporation. Parenteral delivery system utilizing a hollow fiber cellular unit. 4,511,351, Cl. 604-56.000.

Theeuwes, Felix; and Urquhart, John, to ALZA Corporation. Parenteral delivery system with in-line container. 4,511,352, Cl. 604-56.000.

Theeuwes, Felix, to ALZA Corporation. Intravenous system for delivering a beneficial agent. 4,511,353, Cl. 604-85.000.

Theisen, Peter J.: *See—*
Link, Donald A.; Swessel, John A., Jr.; and Theisen, Peter J., 4,511,772, Cl. 200-144.00R.

Thermo Electron Corporation: *See—*
Roussos, Theodore; and Sakhuja, Ravinder K., 4,510,922, Cl. 126-435.000.
Roussos, Theodore; and Sakhuja, Ravinder K., 4,510,922, Cl. 126-435.000.

Thomas, Alan; and Glaze, Stanley G., to Lucas Industries. Valve arrangement for regulating vehicle suspension damping pressures. 4,511,022, Cl. 188-299.000.

Thomas & Betts Corporation: *See—*
Dienes, Zoltan B., 4,511,415, Cl. 156-48.000.

Thomas, Walter; and Lucatuorto, Peter, to Lik-Nu Porcelain, Inc. Repair laminate sheet for acrylic and fiberglass tubs. 4,511,621, Cl. 428-285.000.

Thomas, Willie J.: *See—*
Varga, Sandor I.; Dougherty, Richard L.; Dandy, Donny C.; and Thomas, Willie J., 4,511,158, Cl. 280-292.000.

Thomassen & Drijver-Verblifa N.V.: *See—*
Post, Willem P., 4,510,830, Cl. 83-114.000.

Thompson, David A., to Corning Glass Works. Method for making a volatile cerium diketonate compound. 4,511,515, Cl. 260-429.200.

Thompson, William L.: *See—*
Keyes, Marion A., IV; and Thompson, William L., 4,511,882, Cl. 340-347.0DD.

Thomson-CSF: *See—*
Caillat, Pierre, 4,511,870, Cl. 335-213.000.
Charavit, Jean-Claude; and Vandroux, Michele, 4,511,858, Cl. 331-10.000.
Collumeau, Yoland, 4,510,677, Cl. 29-588.000.
de Riviere, Charles, 4,511,864, Cl. 332-41.000.

Thomson-CSF - Telephone: *See—*
Nicolas, Alain; and Chapelain, Jean, 4,511,959, Cl. 364-200.000.

Thoraval, Yvon, to Schlumberger Technology Corporation. Electromagnetic logging sonde having improved housing. 4,511,843, Cl. 324-338.000.

Thorne, Mark W. Invalid transfer means. 4,510,633, Cl. 5-81.00R.

Thylen, Lars; Stensland, Leif; and Arvidsson, Gunnar, to Institutet for Optisk Forskning. Lensless spectrum analyzer. 4,511,206, Cl. 350-96.110.

Tietjens, Eduard W.: *See—*
Groothuis, Gerrit J.; de Haan, Atze; Poel, Hendrik; Tietjens, Eduard W.; and de Vries, Jochem J., 4,510,687, Cl. 30-34.200.

Tietze, Thomas N., to Panhandle Eastern Pipe Line Company. E-Log I field computer. 4,511,844, Cl. 324-425.000.

Tihanyi, Bela: *See—*
Cornils, Boy; Weber, Jurgen; Tihanyi, Bela; and DeWin, Werner, 4,511,439, Cl. 204-37.100.

Tilson, Alan L.: *See—*
Quay, Earl R.; and Tilson, Alan L., 4,510,773, Cl. 66-9.00B.

Timetco Corporation: *See—*
Bush, Elmer R., 4,511,898, Cl. 343-736.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Izumi, Takayuki, 4,511,456, Cl. 208-44.000.

Tobler, Andreas: *See—*
Baier, Manfred; and Tobler, Andreas, 4,511,873, Cl. 336-90.000.

Todd, Robert R.: *See—*
Decoene, Frans J. G. C.; Strubbe, Gilbert J. I.; and Todd, Robert R., 4,510,946, Cl. 130-27.00T.

Togashi, Kousaku: *See—*
Sekizawa, Hidekazu; Iwamoto, Akito; Togashi, Kousaku; and Fujie, Hideo, 4,510,866, Cl. 101-365.000.

Tokai, Shigeru: *See—*
Tomioka, Kunio; Tokai, Shigeru; and Tsuchida, Tatsuo, 4,510,789, Cl. 72-442.000.

Tokuda, Hiroshi: *See—*
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,511,574, Cl. 514-371.000.

Tokutake, Kunihiko; Mizokami, Nobuo; and Tanaka, Hiroyuki, to Kabushiki Kaisha Kobe Seiko Sho. Diagnosis method of rotary kiln interior. 4,510,807, Cl. 73-432.00R.

Tokuyama, Kanji; Nishitani, Yasuhiro; Tanaka, Mamoru; and Nagata, Wataru, to Shionogi & Co., Ltd. Process for preparing phosphine oxides. 4,511,738, Cl. 568-14.000.

Tokyo Electric Co., Ltd.: *See—*
Kawaguchi, Yukio, deceased; and Kawaguchi, Nobuichi, legal representative, 4,511,833, Cl. 318-696.000.
Miyazaki, Naoki; Horiya, Keiichi; Shiozaki, Tsugio; and Takahama, Kazuhide, 4,511,903, Cl. 346-76.0PH.
Nishikawa, Hisashi; Suzuki, Satoshi; Hirata, Masanobu; Sakamoto, Koichiro; Fujisawa, Ikuo; and Takeno, Shozo, 4,511,877, Cl. 338-2.000.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Nunokawa, Kazuo; and Masuyama, Masayuki, 4,511,227, Cl. 351-208.000.

Tokyo Medical and Dental University: *See—*
Inaba, Yutaka, 4,510,926, Cl. 128-20.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Andow, Fumio; and Nakashima, Masuo, 4,511,981, Cl. 364-492.000.
Hideyama, Shozo; Ishizawa, Akio; Kumagai, Katuya; and Hashimoto, Minoru, 4,511,617, Cl. 428-412.000.
Masuko, Akinori, 4,512,000, Cl. 367-93.000.
Matsuo, Kenji; and Masuda, Eiji, 4,511,814, Cl. 307-572.000.
Murakami, Teruo; and Hoshino, Isao, 4,512,006, Cl. 369-50.000.
Nagano, Katsumi, 4,511,991, Cl. 364-814.000.
Nagashima, Masayoshi, 4,511,902, Cl. 346-76.0PH.
Nakayama, Yasunobu; Sato, Yasuji; and Kunii, Takeshi, 4,511,764, Cl. 179-90.0AN.
Namba, Hiromi, 4,512,032, Cl. 382-9.000.
Okamura, Yoshio, 4,511,780, Cl. 219-10.55C.
Ozeki, Takeshi; and Tamura, Toshifumi, 4,511,208, Cl. 350-96.160.
Sekizawa, Hidekazu; Iwamoto, Akito; Togashi, Kousaku; and Fujie, Hideo, 4,510,866, Cl. 101-365.000.
Sumino, Yoichi; and Enjoji, Susumu, 4,511,984, Cl. 364-415.000.
Takagi, Syoji, 4,510,853, Cl. 99-286.000.
Takahashi, Tomohiko, 4,511,904, Cl. 346-134.000.
Tsuge, Akihiko; Komatsu, Michiyasu; Inoue, Hiroshi; and Komeya, Katsutoshi, 4,511,525, Cl. 264-65.000.
Watanabe, Susumu, 4,511,980, Cl. 364-491.000.
Yamada, Noboru; and Nakamura, Kunihiko, 4,511,136, Cl. 271-187.000.
Yoshihisa, Kozo; and Okui, Isamu, 4,511,849, Cl. 329-103.000.

Tolentino, John, to Chicago Cutlery Consumer Products, Inc. Display case. 4,511,040, Cl. 206-553.000.

Toma, Ken; Iida, Masanao; and Takeuchi, Yo, to Mitsubishi Aluminum Kabushiki Kaisha. Aluminum alloy clad sheet having excellent high-temperature sagging resistance and thermal conductivity. 4,511,632, Cl. 428-654.000.

Tomioka, Kunio; Tokai, Shigeru; and Tsuchida, Tatsuo, to Kabushiki Kaisha Komatsu Seisakusho. Press brake. 4,510,789, Cl. 72-442.000.

Tomita, Fusao; Tamaoki, Tatsuya; Shirahata, Kunikatsu; Iida, Takao; Morimoto, Makoto; and Fujimoto, Kazuhisa, to Kyowa Hakko Kogyo Kabushiki Kaisha. Antibiotic substances DC-45, and their use as medicaments. 4,511,560, Cl. 514-27.000.

Tomoegawa Paper Manufacturing Co., Ltd.: *See—*
Higashi, Kensaku; Yano, Haruhiko; Sato, Hirotsugu; Sukegawa, Ken; and Ooba, Yuji, 4,511,642, Cl. 430-161.000.

Tontarelli, Sergio. Cap for the temporary hermetic closure of cylindrical tin cans with pull-off opening tab. 4,511,057, Cl. 220-306.000.

Toray Industries, Incorporated: *See—*
Iwayama, Kazuyoshi; Kamano, Takao; Tada, Kuniyuki; and Inoue, Takehisa, 4,511,547, Cl. 423-329.000.

Torretta, Roberto: *See—*
Ruscitti, Tomaso; Albini, Giovanni; Torretta, Roberto; and Incerti Baldi, Andrea, 4,511,064, Cl. 222-153.000.

Toshiba Machine Co., Ltd.: *See—*
Sekizawa, Hidekazu; Iwamoto, Akito; Togashi, Kousaku; and Fujie, Hideo, 4,510,866, Cl. 101-365.000.

Toth, Istvan: *See—*
Mogyorodi, Ferenc; Koppany, Eniko; Bodi, Tibor; Balogh, Karoly; Toth, Istvan; Bognar, Rezso; Makleit, Sandor; Litkei, Gyorgy; Rakosi, Miklos; and Dinya, Zoltan, 4,511,736, Cl. 564-214.000.

Toulhoat, Herve : *See—*
Billon, Alain; Jacquin, Yves; Peries, Jean-Pierre; and Toulhoat, Herve , 4,511,458, Cl. 208-59.000.

Tournier, Herve; Johansson, Allan A.; Sachetto, Jean-Pierre; Armanet, Jean-Michel; Michel, Jean-Pierre; and Roman, Alain, to Battelle Memorial Institute. Method for the simultaneous delignification of wood and other ligno-cellulosic materials and hydrolysis of the hemicellulose component thereof. 4,511,433, Cl. 162-16.000.

Towmotor Corporation: *See—*
Melocik, Grant C.; and Pickering, William, 4,511,947, Cl. 361-191.000.

Toya, Ichizo, to Fuji Photo Film Co., Ltd. Color diffusion transfer photographic element. 4,511,643, Cl. 430-212.000.

Toyama, Tadao: *See—*
Koike, Mitsuru; Kobayashi, Kesanao; Toyama, Tadao; Misu, Hiroshi; Tamoto, Koji; and Iwasaki, Masayuki, 4,511,645, Cl. 430-276.000.

Toyo Engineering Corporation: *See—*
Konoki, Keizo; Shinohara, Takanobu; Kochi, Ikuyoshi; Shibata, Keiichi; Nishihara, Hisakatsu; Morichika, Toshiaki; Sugitani, Junichi; and Tsuchida, Koji, 4,510,988, Cl. 164-102.000.

Toyo Ink Mfg. Co., Ltd.: *See—*
Konno, Ryozo; Sugai, Makio; Kubota, Yuichi; Nishimatsu, Masaharu; Isobe, Yukihiro; Tanaka, Kazushi; and Shinoura, Osamu, 4,511,629, Cl. 428-522.000.

Toyo Kogyo Co., Ltd.: *See—*
Kishino, Kohji, 4,511,129, Cl. 296-146.000.

Toyo Kohan Co., Ltd.: *See—*
Fujimoto, Terunori; Shimizu, Nobuyoshi; Shimizu, Mutsuhiro; Yanagihara, Kazunori; Miyachi, Akio; and Inui, Tsuneo, 4,511,631, Cl. 428-632.000.

Toyo Rubber Industry Co., Ltd., The: *See—*
Kishida, Katsuji; Ueno, Tetsuto; Onishi, Masakazu; and Oda, Keijiro, 4,510,984, Cl. 152-362.0CS.
Toyo Seikan Kaisha Ltd.: *See—*
Yazaki, Jinichi; and Sakano, Kozaburo, 4,511,610, Cl. 428-35.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Ariyoshi, Takashi; Emura, Noriaki; and Sakanaka, Yasuhiro, 4,511,679, Cl. 521-83.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Yoneda, Takao; and Sakakibara, Yasuji, 4,510,719, Cl. 51-289.00R.
Toyota Jidosha Kabushiki Kaisha: *See—*
Inui, Masaki, 4,510,818, Cl. 74-477.000.
Inui, Masaki, 4,510,819, Cl. 74-477.000.
Inui, Masaki, 4,510,819, Cl. 74-477.000.
Shimozi, Kozi; and Teshima, Hitoshi, 4,511,536, Cl. 422-171.000.
Tabata, Masaaki; and Miyabayashi, Katsuyuki, 4,511,172, Cl. 296-146.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Watanabe, Hiroyuki; and Tanaka, Yasushi, 4,511,176, Cl. 296-204.000.
Tran-Khanh, Vien: *See—*
Sella, Claude; Tran-Khanh, Vien; and Martin, Jean-Claude, 4,511,451, Cl. 204-298.000.
Transamerica DeLaval Inc.: *See—*
Gartmann, Russell J.; and Brown, James S., 4,510,755, Cl. 60-657.000.
Maddox, James P., 4,511,309, Cl. 415-202.000.
Treace, Harry T.; and Griggs, Calvin, to Treace Medical, Inc. Ossicular prosthesis. 4,510,627, Cl. 3-1.000.
Treace Medical, Inc.: *See—*
Treace, Harry T.; and Griggs, Calvin, 4,510,627, Cl. 3-1.000.
Tremblay, Richard P.: *See—*
Conley, Richard W.; Tremblay, Richard P.; Bolam, Charles W.; Logan, James E.; and Krueger, David A., 4,511,120, Cl. 251-288.000.
Trimmer Machine Co., Inc.: *See—*
Raybuck, William B., 4,511,131, Cl. 270-54.000.
Triouleyre, Jean; Rousselin, Jean; Schmit, Patrick; and Gondry, Philippe, to Ets. Y. Jouanel S.A. Automatic sheet metal folding machine. 4,510,785, Cl. 72-323.000.
Triumph-Adler A.G. fur Buro- und Informationstechnik: *See—*
Bohmer, Christian, 4,511,270, Cl. 400-214.000.
Trott, Delano B., to Beringer Co., Inc. Apparatus for continuous polymer filtration. 4,511,472, Cl. 210-340.000.
Trotta, Robert A., to Gillette Company, The. Correction fluid dispenser having a retractable and lockable sealing tip. 4,511,273, Cl. 401-260.000.
Troup, Robert L.: *See—*
Phelps, Frankie E.; Boget, Paul J.; and Troup, Robert L., 4,511,666, Cl. 501-98.000.
TRP Energy Sensors, Inc.: *See—*
Berndt, Dieter R., 4,511,265, Cl. 374-151.000.
TRW Inc.: *See—*
Ferguson, Blake L.; and Moracz, Donald J., 4,510,788, Cl. 72-377.000.
Prussin, Simon A.; and Hikin, Boris L., 4,510,798, Cl. 73-150.00R.
Trzeciak, John R.: *See—*
Fortunato, Alfred R.; Millard, Maurice; and Trzeciak, John R., 4,511,337, Cl. 434-43.000.
Tsang, Paul J.: *See—*
Anantha, Narasipur G.; Gaur, Santosh P.; Huang, Yi-Shiou; and Tsang, Paul J., 4,510,676, Cl. 29-577.00C.
Tsang, Won-Tien, to AT&T Bell Laboratories. Semiconductor laser having graded index waveguide. 4,512,022, Cl. 372-45.000.
Ts'O, Paul O. P.: *See—*
Miller, Paul S.; and Ts'O, Paul O. P., 4,511,713, Cl. 536-27.000.
Tsuboi, Masaharu, to Honda Giken Kogyo Kabushiki Kaisha. Drum type switch-over mechanism for a speed change device. 4,510,820, Cl. 74-474.000.
Tsubouchi, Kazuo: *See—*
Mikoshiba, Nobuo; Tsubouchi, Kazuo; and Sugai, Kazuyoshi, 4,511,816, Cl. 310-313.00A.
Tsuchida, Koji: *See—*
Konoki, Keizo; Shinohara, Takanobu; Kochi, Ikuyoshi; Shibata, Keiichi; Nishihara, Hisakatsu; Morichika, Toshiaki; Sugitani, Junichi; and Tsuchida, Koji, 4,510,988, Cl. 164-102.000.
Tsuchida, Tatsuo: *See—*
Tomioka, Kunio; Tokai, Shigeru; and Tsuchida, Tatsuo, 4,510,789, Cl. 72-442.000.
Tsuchida, Tsuyoshi; and Kido, Yoshinobu, to Mazda Motor Corporation. Fuel supply control in deceleration of an internal combustion engine for vehicles. 4,510,902, Cl. 123-325.000.
Tsuchie, Takanori: *See—*
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,511,744, Cl. 568-864.000.
Tsuchiya, Hiroshi: *See—*
Seimiya, Ryubun; Tarumi, Noriyoshi; Kokiso, Masakazu; and Tsuchiya, Hiroshi, 4,511,622, Cl. 428-323.000.
Tsuda, Momotoshi: *See—*
Ogawa, Akira; and Tsuda, Momotoshi, 4,511,649, Cl. 430-553.000.
Tsudaka, Hideaki; Washio, Takaji; Kozuka, Nobuhiko; Iseki, Masahide; Watanabe, Toshio; Kai, Masami; Yoshiyama, Toshio; and Sakata, Hiromi, to Mita Industrial Company Limited. Copying apparatus. 4,511,241, Cl. 355-14.0CU.
Tsugami Corporation: *See—*
Ishida, Kenichi; and Takahashi, Tetsuro, 4,510,668, Cl. 29-561.000.
Tsuge, Akihiko; Komatsu, Michiyasu; Inoue, Hiroshi; and Komeya, Katsutoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Process for producing sintered silicon nitride-base body. 4,511,525, Cl. 264-65.000.
Tsuge, Noboru; Taguchi, Masahiro; and Kuwakado, Satosi, to Nippon Soken, Inc. Automobile seat belt winding device. 4,511,097, Cl. 242-55.000.
Tsuge, Noboru: *See—*
Taguchi, Masahiro; Kuwakado, Satosi; and Tsuge, Noboru, 4,510,749, Cl. 60-286.000.
Tsuhara, Susumu: *See—*
Machida, Tetsuo; Tsuhara, Susumu; Tabata, Kuniaki; and Okada, Yasuyuki, 4,511,962, Cl. 364-200.000.
Tsukada, Takami; Akutsu, Masao; and Saito, Tadao, to Yoshino Kogyosho Co., Ltd. Method of making a bottle of saturated polyester resin. 4,511,418, Cl. 156-245.000.
Tsukumo, Masae: *See—*
Tsukumo, Zenzaburo; Tsukumo, Masae; and Tsukumo, Shinsuke, 4,511,102, Cl. 242-130.200.
Tsukumo, Shinsuke: *See—*
Tsukumo, Zenzaburo; Tsukumo, Masae; and Tsukumo, Shinsuke, 4,511,102, Cl. 242-130.200.
Tsukumo, Zenzaburo; Tsukumo, Masae; and Tsukumo, Shinsuke. Bobbin holder. 4,511,102, Cl. 242-130.200.
Tsunoda, Kazuhiko: *See—*
Miyakoshi, Shinichi; and Tsunoda, Kazuhiko, 4,511,013, Cl. 180-227.000.
Tsuzuki, Hiroshige: *See—*
Morihara, Kazuyuki; Oka, Tatsushi; and Tsuzuki, Hiroshige, 4,511,505, Cl. 260-112.700.
Tsyrkin, Mikhail I.: *See—*
Khramtsov, Alexandr A.; Tsyrkin, Mikhail I.; and Shinder, Ilya E., 4,510,849, Cl. 91-515.000.
Tucker, Raymond M.; and Dyer, Clarence L., to Rangaire Corporation. Induction cook-top system and control. 4,511,781, Cl. 219-10.770.
Tung, Chi F.; and Coderre, James C., to Minnesota Mining and Manufacturing Company. Retroreflective sheeting. 4,511,210, Cl. 350-105.000.
Turner, Jonathan S., to AT&T Bell Laboratories. Duplicated network arrays and control facilities for packet switching. 4,512,011, Cl. 370-60.000.
Tuttle, Ralph C.; and Payne, Richard S., to Analog Devices, Incorporated. Process for forming an IC wafer with buried Zener diodes. 4,511,413, Cl. 148-187.000.
Tuttle, Ronald R., to Key Pharmaceuticals, Inc. Senile dementia treatment. 4,511,570, Cl. 514-282.000.
UBE Industries, Inc.: *See—*
Takayama, Seizo, 4,511,319, Cl. 425-145.000.
Uchimura, Shun-ichiro: *See—*
Makino, Daisuke; Sato, Hidetaka; Suzuki, Hiroshi; Uchimura, Shun-ichiro; and Suzuki, Hiroshi, 4,511,705, Cl. 528-26.000.
Uda, Taizo: *See—*
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,511,744, Cl. 568-864.000.
Uematsu, Tamon: *See—*
Mori, Kenji; and Uematsu, Tamon, 4,511,726, Cl. 549-283.000.
Ueno, Tetsuto: *See—*
Kishida, Katsuji; Ueno, Tetsuto; Onishi, Masakazu; and Oda, Keijiro, 4,510,984, Cl. 152-362.0CS.
Uerdingen, Walter: *See—*
Lindner, Christian; Braese, Hans-Eberhard; Ott, Karl-Heinz; and Uerdingen, Walter, 4,511,695, Cl. 525-80.000.
UISE Industries, Ltd.: *See—*
Miyazaki, Haruhiko; Hirai, Koichi; Uda, Taizo; Nakamura, Yasuo; Ikezawa, Harumi; and Tsuchie, Takanori, 4,511,744, Cl. 568-864.000.
Ulvila, Richard M., to Centronics Data Computer Corporation. Stylus recorder linearized drive system. 4,511,905, Cl. 346-140.00A.
Umemoto, Makoto: *See—*
Hirano, Tsumoru; Yagihara, Morio; and Umemoto, Makoto, 4,511,647, Cl. 430-381.000.
Umezawa, Hamao; Oono, Masaji; Ishihama, Hiroshi; Kyotani, Yoshinori; and Takahashi, Yoshio. 3-Alkylidine azetidine compound and their production. 4,511,509, Cl. 260-239.00A.
Uneek Cap and Door, Inc.: *See—*
Wentzel, Harold G., 4,511,173, Cl. 296-156.000.
Uni-Cardan Aktiengesellschaft: *See—*
Krude, Werner, 4,511,344, Cl. 464-139.000.
Uniden Corporation of Japan: *See—*
Yamazaki, Kenji; and Maeda, Kazuo, 4,511,761, Cl. 179-2.0EA.
Unifos Kemi AB: *See—*
Olsson, Stefan; and Widenback, Ralph, 4,511,530, Cl. 264-564.000.
Union Carbide Corporation: *See—*
BeVier, William E., 4,511,375, Cl. 55-28.000.
Craver, Joseph N.; and Horner, Jerome T., 4,511,609, Cl. 428-35.000.
Faulring, Gloria M., 4,511,400, Cl. 75-129.000.
Mayer, Walter P.; and Burns, Richard J., 4,511,682, Cl. 523-402.000.
Nazem, Faramarz; Didchenko, Rostislav; and Fink, David, 4,511,625, Cl. 428-401.000.
Nicholson, Myron D.; and Chiu, Herman S., 4,511,613, Cl. 428-36.000.

Rotramel, George L.; Veilleux, Daniel P.; and Allen, Joseph L., 4,511,579, Cl. 514-490.000.
Wegman, Richard W.; and Busby, David C., 4,511,741, Cl. 568-484.000.
Union Oil Company of California: *See*—
Holstedt, Richard A.; Baron, Kenneth; and Jessup, Peter, 4,511,516, Cl. 260-462.00R.
Unique Technologies, Incorporated: *See*—
Cardarelli, Nathan; and Cardarelli, Bernadette, 4,511,551, Cl. 424-1.100.
U.S. Currency Protection Corp.: *See*—
Bernhardt, Terry L., 4,511,888, Cl. 340-571.000.
United States of America
Air Force: *See*—
Gazzera, Raymond W., 4,510,846, Cl. 91-460.000.
Giles, Michael K.; and Rogers, Robert B., 4,511,219, Cl. 350-388.000.
Hsu, Michael S.; and Hsu, James P., 4,511,216, Cl. 350-311.000.
Morrisey, Edward J., 4,511,105, Cl. 244-135.00R.
Scully, Charles N., 4,511,220, Cl. 350-403.000.
von Gierke, Henning E.; and Marko, Adolf R., 4,511,228, Cl. 351-243.000.
Army: *See*—
Cousins III, Matthew E., 4,511,896, Cl. 340-870.250.
Dixon, Samuel, Jr., 4,511,865, Cl. 333-17.00L.
Gutleber, Frank S., 4,511,885, Cl. 340-347.0DD.
Gutleber, Frank S., 4,512,024, Cl. 375-34.000.
Walters, William P., 4,510,870, Cl. 102-307.000.
Energy: *See*—
Bergman, Robert G.; Janowicz, Andrew H.; and Periana-Pillai, Roy A., 4,511,745, Cl. 570-241.000.
Butler, Barry L., 4,511,215, Cl. 350-295.000.
Cawley, William E., 4,511,114, Cl. 248-550.000.
Dosch, Robert G.; Stephens, Howard P.; and Stohl, Frances V., 4,511,455, Cl. 208-10.000.
Frankel, Robert S.; and Herman, Alexander, 4,512,025, Cl. 375-36.000.
Garcia, Elmer D., 4,510,930, Cl. 128-202.220.
Krishna, Coimbatore R.; and Milau, Julius S., 4,511,474, Cl. 210-512.100.
Motley, Robert W.; and Glanz, James, 4,511,782, Cl. 219-121.00P.
Overmier, David K., 4,510,799, Cl. 73-151.000.
Schlitt, Leland G.; and Szoke, Abraham, 4,511,850, Cl. 330-4.300.
Taylor, Gene W.; and Roybal, Herman E., 4,511,373, Cl. 51-298.000.
Vogel, Wolfgang M.; and Smith, Stanley W., 4,511,636, Cl. 429-41.000.
Health and Human Services: *See*—
Purcell, Robert H.; and Feinstone, Stephen M., 4,511,556, Cl. 514-743.000.
National Aeronautics and Space Administration: *See*—
Ravindram, Maddury; and Kalvinskas, John J., 4,511,362, Cl. 44-1.0SR.
Reichman, Benjamin; and Byvik, Charles E., 4,511,838, Cl. 324-71.500.
U.S. Philips Corporation: *See*—
Groothuis, Gerrit J.; de Haan, Atze; Poel, Hendrik; Tietjens, Eduard W.; and de Vries, Jochem J., 4,510,687, Cl. 30-34.200.
Hofelt, Martijn H. H.; de Niet, Edmond; and Rijckaert, Albert M. A., 4,511,933, Cl. 360-47.000.
Krol, Thijs; and Vonk, Bernardus J., 4,512,020, Cl. 371-37.000.
Matthies, Karl H.; and Harlos, Hartmut, 4,511,853, Cl. 330-259.000.
Milsom, Robert F., 4,511,866, Cl. 333-194.000.
Park, George; Smith, Michael J.; and Carrington, Harry, 4,511,194, Cl. 312-12.000.
Sahakian, Diran R.; Pellerin, Lucien; and Nijboer, Sjoerd, 4,511,769, Cl. 200-6.00A.
Schofield, John, 4,511,867, Cl. 333-195.000.
Span, Francis J.; Boland, Aloysius T. M.; and van Laarhoven, Albertus J. A. J., 4,511,275, Cl. 403-33.000.
Van der Valk, Nicolaas J. L.; Moelands, Antonius G.; and Schmale, Peter C., 4,511,915, Cl. 358-17.000.
Van Gils, Cornelis J. M., 4,512,031, Cl. 381-2.000.
Washington, Derek; and Pook, Roger, 4,511,822, Cl. 313-400.000.
United Technologies Corporation: *See*—
Chenausky, Peter P.; and Hart, Richard A., 4,512,021, Cl. 372-20.000.
Couch, Robert P., 4,510,794, Cl. 73-116.000.
Unitek Corporation: *See*—
Scebold, Robert A.; and Cleary, James D., 4,511,331, Cl. 433-17.000.
Universal Instruments Corporation: *See*—
Foster, James E., 4,510,686, Cl. 29-838.000.
Janisiewicz, Stanley W.; and Rose, Emery L., 4,510,806, Cl. 73-432.00R.
Universal Pioneer Corporation: *See*—
Kosaka, Minoru; and Akiyama, Toru, 4,512,002, Cl. 369-44.000.
Okano, Takashi, 4,512,005, Cl. 369-48.000.
University of California, The Regents of the: *See*—
Fogel, Seymour; Welch, Juliet W.; and Karin, Michael, 4,511,652, Cl. 435-29.000.
University of Illinois, The Board of Trustees of The: *See*—
Holonyak, Nick, Jr., 4,511,408, Cl. 148-1.500.
University of Kentucky Research Foundation, The: *See*—
Kadaba, Pankaja K., 4,511,572, Cl. 514-340.000.
University of Tasmania, The: *See*—
Menary, Robert C.; and Doe, Peter E., 4,511,587, Cl. 426-271.000.
University of Utah: *See*—
Kolff, Willem J., 4,510,628, Cl. 3-1.500.
University Patents, Inc.: *See*—
Goldberg, Ellen H., 4,511,661, Cl. 436-503.000.
Shur, Barry D., 4,511,558, Cl. 514-8.000.
UOP Inc.: *See*—
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., 4,511,514, Cl. 260-419.000.
Hardin, James R., 4,510,996, Cl. 166-227.000.
Rohrbach, Ronald P.; Maliarik, Mary J.; and Malloy, Thomas P., 4,511,654, Cl. 435-95.000.
Swedo, Raymond J.; and House, David W., 4,511,492, Cl. 252-500.000.
Uozumi, Osamu, to Ricoh Company, Ltd. One-rotation clutch. 4,510,833, Cl. 83-205.000.
Upjohn Company, The: *See*—
Lincoln, Kay L.; and Ochoa, Ricardo, 4,510,887, Cl. 119-95.000.
Urani, Angelo, to McGraw-Edison Company. Electrical fuse with response indicator. 4,511,876, Cl. 337-244.000.
Ure, Lynette: *See*—
Remedi, James J.; Reid, Don G.; and Ure, Lynette, 4,511,914, Cl. 357-45.000.
Urquhart, John: *See*—
Theeuwes, Felix; and Urquhart, John, 4,511,352, Cl. 604-56.000.
Ushio Denki Kabushiki Kaisha: *See*—
Arai, Tetsuji; and Mimura, Yoshiki, 4,511,788, Cl. 219-405.000.
Ushiro, Tatsuzo, to Canon Kabushiki Kaisha. Video recording camera. 4,511,932, Cl. 360-33.100.
USM Corporation: *See*—
Garley, Anthony M.; and Stafford, Rita A., 4,510,876, Cl. 112-262.100.
Leech, Francis, 4,510,823, Cl. 74-789.000.
Peck, Alan M., 4,510,875, Cl. 112-121.120.
Usui, Fumio. Apparatus for producing sheet molding compound. 4,511,424, Cl. 156-426.000.
V. E. Anderson Mfg. Co.: *See*—
Anderson, Richard N., 4,510,713, Cl. 49-175.000.
Vaillancourt, Vincent L., to Manresa, Inc. Sterile connection device. 4,511,359, Cl. 604-411.000.
Valencia, Jaime A.; and Denton, Robert D., to Exxon Production Research Co. Method of separating acid gases, particularly carbon dioxide, from methane by the addition of a light gas such as helium. 4,511,382, Cl. 62-20.000.
Valenti, Salvatore: *See*—
Runyon, James R.; and Valenti, Salvatore, 4,511,707, Cl. 528-250.000.
Valko, Joseph T., to PPG Industries, Inc. Electrodeposition of resinous compositions curable through a transesterification curing mechanism. 4,511,447, Cl. 204-181.00C.
Valspar Corporation, The: *See*—
Anderson, Jeffrey L.; Ruhoff, Philip J.; and Edenborg, Robert B., 4,511,692, Cl. 525-7.000.
Valstyn, Erich P., to Computer & Communications Technology Corp. Automatic throat height control for film heads. 4,511,942, Cl. 360-126.000.
Vanbragt, Willy. Fluid lamp assembly. 4,511,952, Cl. 362-181.000.
Vandegraaf, Johannes J., to General Electric Company. Combined modulation and temperature compensation circuit. 4,511,863, Cl. 332-18.000.
Vander Meiden, Orrie J., to Siemens Corporate Research & Support, Inc. Data format for asynchronous data transmission. 4,512,026, Cl. 375-114.000.
Van der Valk, Nicolaas J. L.; Moelands, Antonius G.; and Schmale, Peter C., to U.S. Philips Corporation. Color television encoding circuit. 4,511,915, Cl. 358-17.000.
Vandroux, Michele: *See*—
Charavit, Jean-Claude; and Vandroux, Michele, 4,511,858, Cl. 331-10.000.
Van Gils, Cornelis J. M., to U.S. Philips Corporation. Arrangement for receiving TV-signals having left and right stereo sound signals. 4,512,031, Cl. 381-2.000.
van Iperen, Willem H. P., to Sea-Land Industries, Inc. Cargo restraining device. 4,510,652, Cl. 24-68.0CD.
van Laarhoven, Albertus J. A. J.: *See*—
Span, Francis J.; Boland, Aloysius T. M.; and van Laarhoven, Albertus J. A. J., 4,511,275, Cl. 403-33.000.
van Mil, Martinus P. G., to Stork PMT B.V. Device for emptying a container filled with live poultry. 4,510,886, Cl. 119-82.000.
van Mondfrans, Gerardus H.: *See*—
Blaak, Cornelis; and van Mondfrans, Gerardus H., 4,510,863, Cl. 101-119.000.
van Wieringen, Gijsbertus L., to N.V. Nederlandse Metaalindustrie Polynorm. Device adapted to mount a metal jamb or frame, more particularly a door jamb, into a wall opening. 4,510,722, Cl. 52-213.000.
Varga, Sandor I.; Dougherty, Richard L.; Dandy, Donny C.; and Thomas, Willie J., to Mt. Sinai Medical Center of Greater Miami. Intravenous infusion pole attachment. 4,511,158, Cl. 280-292.000.
Vasalos, Iacovos, to Standard Oil Company (Indiana). Fluid bed retorting system. 4,511,434, Cl. 202-99.000.
Vasco, Augusto. Method and apparatus for recycling thermoplastic scrap. 4,511,091, Cl. 241-18.000.

Vats, Ashok: *See*—
Bellar, Robert J.; Golden, William G.; Saperstein, David D.; and Vats, Ashok, 4,511,986, Cl. 364-576.000.

VDO Adolf Schindling AG: *See*—
Nickol, Friedrich W., 4,511,634, Cl. 428-686.000.
Rau, Karl, 4,510,968, Cl. 137-590.000.

VEB Kombinat Fortschritt Landmaschinen: *See*—
Prellwitz, Hubert, 4,511,165, Cl. 289-8.000.

VEB Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Forster, Karl-Heinz; Schuck, Helmut; Johne, Hans; and Jentzsch, Arndt, 4,510,867, Cl. 101-365.000.

VEB Kombinat Textima: *See*—
Rose, Wolfgang, 4,510,774, Cl. 66-75.200.

Veilleux, Daniel P.: *See*—
Rotramel, George L.; Veilleux, Daniel P.; and Allen, Joseph L., 4,511,579, Cl. 514-490.000.

Vella, Paul L., to Ziegler, Thomas K.; and Lucas, David J. Chest for storing, cooling and dispensing comestibles. 4,510,770, Cl. 62-464.000.

Venkatesan, Thirumalai N. C.: *See*—
Forrest, Stephen R.; Kaplan, Martin L.; Schmidt, Paul H.; and Venkatesan, Thirumalai N. C., 4,511,445, Cl. 204-158.0HE.

Verdicchio, Robert J.: *See*—
Guth, Jacob J.; and Verdicchio, Robert J., 4,511,513, Cl. 260-404.500.

Vereinigte Drahtwerke AG: *See*—
Brunner, Paul; and Hofer, Beat, 4,511,411, Cl. 148-20.300.

Vereinigte Flugtechnische Werke GmbH: *See*—
Balaskas, Spyros, 4,510,973, Cl. 137-625.640.

Vermeiren, Karel N.; and Dolfsma, Hendrik, to SKF Industrial Trading & Development Co., B.V. Measuring system for measuring the variation of the capacitive impedance of a bearing installed in a housing. 4,511,837, Cl. 324-61.00R.

Vermont Castings, Inc.: *See*—
Ferguson, Robert W.; Andors, Derik K.; and Crossman, William W., Jr., 4,510,918, Cl. 126-79.000.

Vetelino, John F.: *See*—
Chai, Bruce H.; Bailey, Dana S.; Vetelino, John F.; Lee, Donald L.; and Andle, Jeffrey C., 4,511,817, Cl. 310-313.00A.

Victor, Alan M.; and Davis, Darrell E., to Motorola, Inc. Method of programming a synthesizer ROM for elimination of receiver self-quieting. 4,512,035, Cl. 455-165.000.

Victor Company of Japan, Limited: *See*—
Inami, Mamoru; Tanaka, Yoshiaki; and Otsuki, Zenju, 4,510,840, Cl. 84-477.00R.
Wada, Kinzo, 4,511,828, Cl. 318-254.000.

Viering, Walter: *See*—
Korner, Gerhard; Plettner, Horst; Viering, Walter; and Rees, Volker, 4,511,775, Cl. 200-148.00A.

Vigh, Zoltan: *See*—
Budai, Zoltan; Kis-Tamas, Attila; Mezei, Tibor; Lay, Aranka; Vigh, Zoltan; and Sokorai, Agnes, 4,511,737, Cl. 564-257.000.

Vijayendran, Bheema R.: *See*—
Dolce, Thomas J.; and Vijayendran, Bheema R., 4,511,527, Cl. 264-328.200.

Vogel, Wolfgang M.; and Smith, Stanley W., to United States of America, Energy. Molten carbonate fuel cell matrices. 4,511,636, Cl. 429-41.000.

Vogele, Gunther: *See*—
Buchner, Norbert; and Vogele, Gunther, 4,511,538, Cl. 422-303.000.

Volakakis, John G.; McNelis, Robert L.; and Wallentin, Burt H., to Handling Systems, Inc. Jib crane system having a rotatable mast. 4,511,048, Cl. 212-253.000.

Volk, Joseph F.: *See*—
German, Martin A.; and Volk, Joseph F., 4,510,716, Cl. 51-5.00D.

Vollbrecht, Heinz-Rudiger; Schutz, Erwin; and Sandner, Klaus, to SKW Trostberg AG. Process for drying of natural extracts prepared by high pressure extraction. 4,511,508, Cl. 426-665.000.

von Daehne, Welf, to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Produktionsaktienselskab). Substantially pure dicyclohexyl ammonium 6-β-bromo-penicillanate. 4,511,512, Cl. 260-245.20R.

von Gierke, Henning E.; and Marko, Adolf R., to United States of America, Air Force. Measurement of visual contrast sensitivity. 4,511,228, Cl. 351-243.000.

Vonk, Bernardus J.: *See*—
Krol, Thijs; and Vonk, Bernardus J., 4,512,020, Cl. 371-37.000.

Von Wallenberg, Ducius: *See*—
Dittner, Adam; Schurr, Heinrich; and Von Wallenberg, Ducius, 4,511,971, Cl. 364-426.000.

Voorheis, Temple S., to Coen Company, Inc. System for the reduction of NO_x emissions. 4,511,325, Cl. 431-10.000.

W. L. Gore & Associates, Inc.: *See*—
Henderson, Deborah; and Street, Norman, 4,510,931, Cl. 128-202.280.

W. R. Grace & Co.: *See*—
Okamoto, Yoshiyuki; and Hwang, Edward F!, 4,511,702, Cl. 526-90.000.

WABCO Westinghouse Fahrzeugbremsen GmbH: *See*—
Klatt, Alfred, 4,510,906, Cl. 123-396.000.

Wada, Kinzo, to Victor Company of Japan, Ltd. D.C. commutatorless electric motor. 4,511,828, Cl. 318-254.000.

Wadsworth, Harry J.: *See*—
McCullagh, Keith G.; Wadsworth, Harry J.; and Hann, Michael M., 4,511,504, Cl. 260-112.50R.

Wagner Spray Tech Corporation: *See*—
Karliner, Rudy R.; and Peterson, Gerald E., 4,511,427, Cl. 156-523.000.

Wahle, Gunter: *See*—
Greve, Heinz; and Wahle, Gunter, 4,510,885, Cl. 118-674.000.

Waitzman, Michael D. Jewelry display tray and security system. 4,511,041, Cl. 206-566.000.

Walker, John W.: *See*—
Byatt, Dennis W. G.; and Walker, John W., 4,510,804, Cl. 73-290.00V.

Walker, Mathew. Camping and recreation trailer. 4,511,174, Cl. 296-173.000.

Walker-Neer Manufacturing Co., Inc.: *See*—
Willis, Clyde A., 4,511,169, Cl. 294-116.000.

Walker, Thad O.: *See*—
Peiffer, Dennis G.; Lundberg, Robert D.; and Walker, Thad O., 4,510,998, Cl. 166-295.000.

Wallace, Leslie E., to Dow Chemical Company, The. Addition of additives to plastics. 4,511,603, Cl. 427-222.000.

Wallentin, Burt H.: *See*—
Volakakis, John G.; McNelis, Robert L.; and Wallentin, Burt H., 4,511,048, Cl. 212-253.000.

Walliker, John R.: *See*—
Fourcin, Adrian J.; Howard, David M.; and Walliker, John R., 4,510,936, Cl. 128-419.00R.

Walmet, Gunnar E., to New York State Energy Research and Development Authority. Heat exchanger mat. 4,510,920, Cl. 126-415.000.

Walsh, Richard J.; and Gyles, Darrell D., to Sunsweet Growers of California. Method and apparatus for detecting an irregular product in a product flow. 4,511,046, Cl. 209-539.000.

Walter, Lothar; and Reith, Walter, to SKF GmbH. Ball bearing for lengthwise and turning movement. 4,511,188, Cl. 308-6.00C.

Walters, William P., to United States of America, Army. Charge liner construction and method. 4,510,870, Cl. 102-307.000.

Wang, Chun S.; Benkendorfer, Kyle B.; and Burba, John L., III, to Dow Chemical Company, The. Halide removal from fluid organic materials. 4,511,710, Cl. 528-485.000.

Ward, Peter: *See*—
Evason, John; Rigby, Malcolm J.; and Ward, Peter, 4,511,384, Cl. 65-114.000.

Warner & Swasey Co., The: *See*—
German, Martin A.; and Volk, Joseph F., 4,510,716, Cl. 51-5.00D.

Washington, Derek; and Pook, Roger, to U.S. Philips Corporation. Image display tube having a channel plate electron multiplier. 4,511,822, Cl. 313-400.000.

Washio, Takaji: *See*—
Tsudaka, Hideaki; Washio, Takaji; Kozuka, Nobuhiko; Iseki, Masahide; Watanabe, Toshio; Kai, Masami; Yoshiyama, Toshio; and Sakata, Hiromi, 4,511,241, Cl. 355-14.0CU.

Washiyama, Shigemichi: *See*—
Takahashi, Tohru; Tajima, Hatsuo; Shigenobu, Michio; and Washiyama, Shigemichi, 4,511,778, Cl. 219-10.55A.

Watanabe, Hiroshi: *See*—
Izumi, Eiki; Watanabe, Hiroshi; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,510,750, Cl. 60-443.000.

Watanabe, Hiroyuki; and Tanaka, Yasushi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Vehicle body floor construction of motor vehicle. 4,511,176, Cl. 296-204.000.

Watanabe, Katsuhiro; Minei, Masayuki; and Horikoshi, Toshio, to San-Ei Kagaku Co., L.T.D. Method and apparatus for diagnosis of hair for permanent waving. 4,510,951, Cl. 132-7.000.

Watanabe, Nobuatsu; Nakajima, Tsuyoshi; and Kawaguchi, Masayuki, to Watanabe, Nobuatsu. Ternary intercalation compound of a graphite with a metal fluoride and fluorine, a process for producing the same, and an electrically conductive material comprising the ternary intercalation compound. 4,511,493, Cl. 252-507.000.

Watanabe, Shigetaka: *See*—
Natori, Takeshi; Kobayashi, Yoji; Watanabe, Shigetaka; Shimizu, Katsumi; Matsumura, Ikuei; Namekawa, Yoshihiro; and Miyanaga, Satoshi, 4,510,974, Cl. 138-137.000.

Watanabe, Susumu, to Tokyo Shibaura Denki Kabushiki Kaisha. Electron beam exposure apparatus. 4,511,980, Cl. 364-491.000.

Watanabe, Tetsuya: *See*—
Nakamura, Toshiro; and Watanabe, Tetsuya, 4,510,699, Cl. 36-43.000.

Watanabe, Toshio: *See*—
Tsudaka, Hideaki; Washio, Takaji; Kozuka, Nobuhiko; Iseki, Masahide; Watanabe, Toshio; Kai, Masami; Yoshiyama, Toshio; and Sakata, Hiromi, 4,511,241, Cl. 355-14.0CU.

Watson Industries, Inc.: *See*—
Watson, William S., 4,511,848, Cl. 329-50.000.

Watson, Keith G.: *See*—
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; and Farquharson, Graeme J., 4,511,391, Cl. 71-88.000.

Watson, William S., to Watson Industries, Inc. Synchronous AM demodulator with quadrature signal cancellation. 4,511,848, Cl. 329-50.000.

Weaver, Gregory A.: *See*—
Weaver, Richard T.; and Weaver, Gregory A., 4,510,879, Cl. 114-162.000.

Weaver, Richard T.; and Weaver, Gregory A. Anti-cavitation rudder blade. 4,510,879, Cl. 114-162.000.

Webb, David M.; and Lane, Thomas A., to Control Data Corporation. Multi-group LRU resolver. 4,511,994, Cl. 364-900.000.

Weber, Heinz: *See*—
Mahnke, Harald; Woerner, Frank P.; Weber, Heinz; and Kreibiehl, Guenter, 4,511,678, Cl. 521-52.000.

Weber, Jurgen: *See*—
Cornils, Boy; Weber, Jurgen; Tihanyi, Bela; and DeWin, Werner, 4,511,439, Cl. 204-37.100.

Wefel, Jerry D.: *See*—
Aleem, Mohd A.; Lobsinger, James L.; and Wefel, Jerry D., 4,510,679, Cl. 29-598.000.

Wegman, Richard W.; and Busby, David C., to Union Carbide Corporation. Production of aldehydes from organic acid esters. 4,511,741, Cl. 568-484.000.

Weigel, Horst: *See*—
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,511,719, Cl. 546-245.000.

Weiner, Antoine, to Arbed S.A. Process for increasing the degree of afterburning of carbon monoxide in the refining of iron melts. 4,511,397, Cl. 75-59.170.

Weinerman, Lee S., to Eastern Company, The. Handle-operated door lock with latch-operator override. 4,511,166, Cl. 292-29.000.

Weiss, Eberhard, to International Standard Electric Corporation. Method of forming hot cathodes. 4,511,340, Cl. 445-6.000.

Weisser, Bernard G.: *See*—
Caye, Paul D.; Jamain, Patrice C.; and Weisser, Bernard G., 4,511,190, Cl. 308-10.000.

Welch, Juliet W.: *See*—
Fogel, Seymour; Welch, Juliet W.; and Karin, Michael, 4,511,652, Cl. 435-29.000.

Wendling, Jean. Valve for pressurized cylinders for liquified gas. 4,510,964, Cl. 137-210.000.

Wendt, Michael; and Schwanbom, Erik, to Dragerwerk Aktiengesellschaft. Suction adapter and medical draining set and method of using a tracheal draining device. 4,510,933, Cl. 128-207.140.

Wenger, Robert L. Bowling ball retainer-towel device. 4,511,140, Cl. 273-54.00B.

Wentzel, Harold G., to Uneek Cap and Door, Inc. Pickup truck cap having a roll-away door. 4,511,173, Cl. 296-156.000.

Werner & Pfleiderer: *See*—
Lambertus, Friedrich, 4,511,320, Cl. 425-199.000.

Wescam Services Inc.: *See*—
Hauptmann, Edward G., 4,511,379, Cl. 55-238.000.

Wesseling, Karel H., to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek. Plethysmograph pressure correcting arrangement. 4,510,940, Cl. 128-667.000.

West Company, The: *See*—
Connor, John T.; Halsted, Charles P.; and Ravn, Jacob, 4,511,044, Cl. 209-522.000.

West-Point Pepperell, Inc.: *See*—
Alexander, Edward N.; and Smith, Richard, 4,511,463, Cl. 209-166.000.

Westberg, Russell C. Honing control system. 4,510,720, Cl. 51-34.00J.

Westdorp, Wolfgang A.: *See*—
Ghosh, Hitendra; Murgai, Ashok; and Westdorp, Wolfgang A., 4,511,428, Cl. 156-601.000.

Westfalische Metall Industrie KG Hueck & Co.: *See*—
Ernst, Hans-Otto; and Rohling, Wilhelm, 4,511,955, Cl. 362-347.000.

Westinghouse Electric Corp.: *See*—
Amirante, Dominic, 4,511,979, Cl. 364-481.000.
Hultgren, Kent G., 4,511,306, Cl. 415-136.000.
Johnston, Paul M., 4,511,894, Cl. 340-756.000.
Killingsworth, Emmett D., 4,511,798, Cl. 250-231.0SE.
Kwon, Young J.; and Evans, Harmon A., 4,511,399, Cl. 75-84.500.
MacDonald, Robert C., 4,511,017, Cl. 187-29.00R.
Meuschke, Robert E.; and Schulties, Joseph R., 4,511,499, Cl. 252-626.000.
Schmitz, William E., 4,511,832, Cl. 318-685.000.
Swidwa, Kenneth J.; Hornak, Leonard P.; and Kowalski, Edward F., 4,511,531, Cl. 376-262.000.
Yeo, Denis, 4,511,075, Cl. 228-7.000.

Westphal, Manfred, to Dornier System GmbH. Device for connecting and guiding the individual collapsible elements of a rigid, collapsible antenna reflector. 4,511,901, Cl. 343-915.000.

Westvaco Corporation: *See*—
Noble, John W., 4,511,691, Cl. 524-745.000.

Wetmore, Sherman B., to Global Marine Inc. Modular island drilling system. 4,511,288, Cl. 405-217.000.

Wetzel, David L.; and Shah, Mahesh, to Northern Telecom Limited. Key telephone system signalling and control arrangement. 4,511,767, Cl. 179-99.00A.

Wheeler, Glynn P.: *See*—
Temple, Carroll G., Jr.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,511,721, Cl. 546-308.000.

Whitcomb, Carl E., to Oklahoma Agriculture and Mechanical Colleges Acting for and in Behalf of Oklahoma State University, Board of Regents for the. Air-root-pruning container. 4,510,712, Cl. 47-66.000.

White Consolidated Industries, Inc.: *See*—
Moore, James G.; Obey, James H.; and Pinkel, Edward B., 4,511,431, Cl. 159-47.100.

White, Harold R., to Alar Engineering Corporation. Rotary vacuum pre-coat filter apparatus. 4,511,468, Cl. 210-181.000.

White, John D. Window-mounted Christmas tree. 4,511,607, Cl. 428-13.000.

White, Leola E. Seam ripper. 4,510,688, Cl. 30-294.000.

Widenback, Ralph: *See*—
Olsson, Stefan; and Widenback, Ralph, 4,511,530, Cl. 264-564.000.

Widmaier, Richard: *See*—
Kuehn, Volker; Rothfuss, Werner; and Widmaier, Richard, 4,511,421, Cl. 156-356.000.

Wiechert, Rudolf: *See*—
Laurent, Henry; Nickisch, Klaus; Bittler, Dieter; Wiechert, Rudolf; and Losert, Wolfgang, 4,511,565, Cl. 514-173.000.

Wieland, Rolf H., to Messer Griesheim Industries, Inc. Compact integrated gas phase separator and subcooler and process. 4,510,760, Cl. 62-49.000.

Wiersema, Richard J.: *See*—
Stanislowski, Anna G.; and Wiersema, Richard J., 4,511,490, Cl. 252-174.120.

Wiese, Winfred J., to Borg-Warner Corporation. Mechanical seal with cylindrical balance sleeve. 4,511,149, Cl. 277-3.000.

Wilde, Eugen: *See*—
Goessler, Gerhard; and Wilde, Eugen, 4,511,789, Cl. 219-446.000.

Wilkerson, William E. Canisters for pressurized gas and personal security devices utilizing same. 4,511,062, Cl. 222-47.000.

Wilkinson, Philip M.: *See*—
Lawrence, Christopher J.; Wilkinson, Philip M.; and Atkinson, Colin, 4,510,744, Cl. 57-280.000.

Williams, Foster R.: *See*—
Arter, William L.; and Williams, Foster R., 4,511,785, Cl. 219-124.340.

Williams, Francis V., to Lucas Industries Limited. Disc brakes. 4,511,020, Cl. 188-73.390.

Williams, Gerald J. Cam operated engine. 4,510,894, Cl. 123-48.00R.

Williams, Michael M.: *See*—
Madsen, Roger E.; and Williams, Michael M., 4,511,080, Cl. 229-41.00C.

Willis, Clyde A., to Walker-Neer Manufacturing Co., Inc. Self locking and unlocking elevator assembly. 4,511,169, Cl. 294-116.000.

Wilson, James D.: *See*—
Ellingson, David I.; and Wilson, James D., 4,510,777, Cl. 68-12.00R.

Wilson, Mark E. Building block and construction system. 4,510,725, Cl. 52-309.100.

Wilson, Peter K., to Broken Hill Proprietary Company Limited, The. Rail anchoring clip and associated sleeper. 4,511,081, Cl. 238-59.000.

Wilson, William C.; and Green, Michael H., to Eastman Kodak Company. Apparatus and method for offsetting and delaying delivery of sheets in an adhesive binder. 4,511,297, Cl. 412-8.000.

Wilt, Chester F., Jr., to St. Joseph's Hospital and Medical Center. Apparatus for facilitating intravenous feeding during transportation of patient. 4,511,157, Cl. 280-289.0WC.

Wilt, Henry E.; and Murray, Larry N., to Fabralloy, Inc. Liquid distribution device. 4,511,088, Cl. 239-455.000.

Winchell, David A.: *See*—
Fowles, Thomas A.; Slater, Glenn L.; and Winchell, David A., 4,511,529, Cl. 264-515.000.

Wincze, Steven P.; and Rickard, Earl K., to Combustion Engineering, Inc. Seal for boiler water wall. 4,510,892, Cl. 122-510.000.

Windall, Owen D. Practice golf net device. 4,511,146, Cl. 273-181.00J.

Winkler, Otmar, to SKF Kugellagerfabriken GmbH. Constant speed joint assembly. 4,511,345, Cl. 464-145.000.

Winseck, Michael M., Jr.: *See*—
Fulcomer, Emanuel J., Jr.; Nici, Richard J.; Poteat, Vance E.; Schramm, George W.; Sharp, John B.; and Winseck, Michael M., Jr., 4,512,016, Cl. 370-110.100.

Wischusen, Henry, III, to Rock-Tenn Company. Combination snack food tray. 4,511,042, Cl. 206-611.000.

Wisniewski, Waldemar S., to Exploration Logging, Inc. Direct current control in inductive loads. 4,511,829, Cl. 318-317.000.

Witalka, Jerome J.; Buettner, Howard L.; and Ellsworth, James G., to Sperry Corporation. Simultaneous load and verify of a device control store from a support processor via a scan loop. 4,511,967, Cl. 364-200.000.

Witdoek, Daniel C.; and Dhont, Andre G. J., to Sperry Corporation. Drive tensioning apparatus. 4,511,348, Cl. 474-109.000.

Wittig, Karl R., to North American Philips Corporation. Compensation for differences in gain among amplifiers. 4,511,855, Cl. 330-279.000.

Wloczyk, Uwe, to Lucas Industries Public Limited Company. Brake pressure regulator for an hydraulic vehicle braking system. 4,511,185, Cl. 303-6.00C.

Woerner, Frank P.: *See*—
Mahnke, Harald; Woerner, Frank P.; Weber, Heinz; and Kreibiehl, Guenter, 4,511,678, Cl. 521-52.000.

Woffendin, Arnold, to Silentnight Holdings PLC. Box spring assemblies. 4,510,635, Cl. 5-247.000.

Wolbrink, David W.: *See*—
Sarnosky, Joseph R.; Wolbrink, David W.; and Otte, Dieter W., 4,510,851, Cl. 98-42.080.

Wolf, Lajos: *See*—
Szendrei, Kalman; Minker, Emil; Rozsa, Zsuzsanna; Koch, Lehel; and Wolf, Lajos, 4,511,559, Cl. 514-54.000.

Wolf, Leslie G., II: *See*—
Diedrich, Brian J.; and Wolf, Leslie G., II, 4,510,634, Cl. 5-98.00B.

Won, Vann Y. Top feeding liquid atomizer. 4,511,084, Cl. 239-223.000.

Wong, Wai C.: *See*—
Nash, Randy D.; and Wong, Wai C., 4,512,013, Cl. 370-69.100.

Wood, John; and Dominey, Raymond J., to De La Rue Systems Limited. Cash dispensing apparatus. 4,511,795, Cl. 235-379.000.

Wood, Peter N., to International Rectifier Corporation. Transformer-isolated power MOSFET driver circuit. 4,511,815, Cl. 307-584.000.

Woodruff, Roger D., to Champion Corporation. Latch for securing reel carrying spindles to a loading and unloading mechanism. 4,511,304, Cl. 414-546.000.

Woods, Richard E.; and Bradburn, Marvin D., to Car-Go, Corp. Vehicle compactor. 4,510,858, Cl. 100-35.000.

Wright, Bernard S.; Hsia, Chung H.; and Owen, Hartley, to Mobil Oil Corporation. Light olefin conversion to heavier hydrocarbons with sorption recovery of unreacted olefin vapor. 4,511,747, Cl. 585-415.000.

Wu, Tai T.: *See*—
Schwartz, Jack; and Wu, Tai T., 4,511,229, Cl. 354-20.000.

Wu, Yulin. Composition and method for corrosion inhibition. 4,511,001, Cl. 166-310.000.

Wuerzer, Bruno: *See*—
Hagen, Helmut; Markert, Juergen; Kohler, Rolf-Dieter; and Wuerzer, Bruno, 4,511,393, Cl. 71-92.000.

Wurzburg, Henry, to Motorola, Inc. Method and apparatus for obtaining small fractional units of capacitance. 4,511,851, Cl. 330-51.000.

Xerox Corporation: *See*—
Creagh, Linda T., 4,511,598, Cl. 427-58.000.
Smith, Craig A., 4,511,243, Cl. 355-14.0CU.

Yachigo, Shinichi: *See*—
Ishii, Tamaki; Yachigo, Shinichi; and Takahashi, Yukoh, 4,511,491, Cl. 252-404.000.

Yagihara, Morio: *See*—
Hirano, Tsumoru; Yagihara, Morio; and Umemoto, Makoto, 4,511,647, Cl. 430-381.000.

Yakura, John, to California Linear Circuits, Inc. Process for making stacked high voltage rectifiers. 4,510,672, Cl. 29-574.000.

Yale-New Haven Hospital, Inc.: *See*—
Gray, Laurence A., 4,510,924, Cl. 128-1.200.

Yamada, Ichiho: *See*—
Ida, Jinsei; Fujita, Tsutomu; Yamada, Ichiho; Higuchi, Fumio; and Matsuo, Kenzaburo, 4,510,669, Cl. 29-568.000.

Yamada, Jiro; Maeda, Tetsuo; and Yasuda, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Apparatus for controlling linear tracking arm in record player. 4,512,010, Cl. 369-220.000.

Yamada, Noboru; and Nakamura, Kunihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Sheet handling device. 4,511,136, Cl. 271-187.000.

Yamada, Osamu: *See*—
Ninagawa, Yoichi; Yamada, Osamu; Renge, Tsumoru; Kyo, Sunao; Osaki, Takayoshi; and Kushida, Koichi, 4,511,751, Cl. 585-608.000.

Yamada, Yasuaki; Ozawa, Toshiaki; and Kondo, Hiroatsu, to Canon Kabushiki Kaisha. Servo control apparatus. 4,511,830, Cl. 318-318.000.

Yamada, Yasuyuki, to Canon Kabushiki Kaisha. Auto-focus camera. 4,511,232, Cl. 354-403.000.

Yamaguchi, Katsumi; Takai, Kazuki; and Okada, Hitoshi, to Clarion Co., Ltd. Tape player having motor-driven tape-pack loading mechanism. 4,511,940, Cl. 360-96.600.

Yamaguchi, Toshiaki, to Kinugawa Rubber Industrial Co., Ltd. Method for making weatherstripping having a rough, low-friction surface. 4,511,526, Cl. 264-129.000.

Yamahara, Noboru: *See*—
Shinohara, Hironobu; Yamahara, Noboru; and Yoshida, Yoshinori, 4,511,683, Cl. 524-3.000.

Yamamoto, Akio: *See*—
Nakamura, Yoichi; Yamamoto, Akio; Nogita, Shunsuke; Kuge, Toshio; and Muroi, Katsumi, 4,511,363, Cl. 44-1.00G.

Yamamoto, Hachizou: *See*—
Nakatani, Hiroshi; and Yamamoto, Hachizou, 4,511,891, Cl. 340-734.000.

Yamamoto, Masafumi, to Isolite Babcock Refractories Co., Ltd. Process for manufacturing ceramic fibers consisting mainly of alumina and silica. 4,511,664, Cl. 501-35.000.

Yamamuro, Sigeaki; Hirano, Hiroyuki; Morimoto, Yoshiro; and Tanaka, Yoshikazu, to Nissan Motor Company, Limited. Continuously variable V-belt transmission including hydrodynamic transmission unit with lock-up means. 4,510,822, Cl. 74-733.000.

Yamashita, Kiyoshi; and Iijima, Toshifumi, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic material. 4,511,648, Cl. 430-503.000.

Yamashita, Norio: *See*—
Komatsu, Fumiaki; Saegusa, Kazuyuki; Seshimo, Yu; and Yamashita, Norio, 4,510,767, Cl. 62-200.000.

Yamazaki, Kenji; and Maeda, Kazuo, to Uniden Corporation of Japan. Automatic communication standby device in cordless telephone. 4,511,761, Cl. 179-2.0EA.

Yamazaki, Yasuhiro; and Endo, Toshiaki, to Kokusai Denshin Denwa Kabushiki Kaisha. Coding method for multilevel-gradated picture signal. 4,511,213, Cl. 358-261.000.

Yan, Tsoung Y.; and Shu, Paul, to Mobil Oil Corporation. Simultaneous coking of residual oil and partial gasification and desulfurization of coal. 4,511,459, Cl. 208-127.000.

Yanagihara, Kazunori: *See*—
Fujimoto, Terunori; Shimizu, Nobuyoshi; Shimizu, Mutsuhiro; Yanagihara, Kazunori; Miyachi, Akio; and Inui, Tsuneo, 4,511,631, Cl. 428-632.000.

Yanai, Akio; and Shirahata, Ryuji, to Fuji Photo Film Co., Ltd. System of manufacturing magnetic recording media. 4,511,594, Cl. 427-38.000.

Yano, Haruhiko: *See*—
Higashi, Kensaku; Yano, Haruhiko; Sato, Hirotsugu; Sukegawa, Ken; and Ooba, Yuji, 4,511,642, Cl. 430-161.000.

Yano, Naomichi; Makido, Isao; and Ito, Hajime, to Kubota Ltd. Latent heat accumulating greenhouse. 4,510,921, Cl. 126-429.000.

Yano, Takashi, to Ricoh Company, Ltd. Electrophotographic process. 4,511,236, Cl. 355-3.0BE.

Yasuda, Haruo: *See*—
Miyamae, Ryuichi; and Yasuda, Haruo, 4,510,942, Cl. 128-680.000.

Yasuda, Hiroshi: *See*—
Yamada, Jiro; Maeda, Tetsuo; and Yasuda, Hiroshi, 4,512,010, Cl. 369-220.000.

Yatabe, Fumio; and Ozaki, Syunzaburo, to Honda Giken Kogyo Kabushiki Kaisha. Throttle valve control apparatus. 4,510,901, Cl. 123-325.000.

Yazaki, Jinichi; and Sakano, Kozaburo, to Toyo Seikan Kaisha Ltd. Multi-layer drawn plastic vessel. 4,511,610, Cl. 428-35.000.

Yealy, Carl F., to Merline Industries, Inc. Cable reel with reinforcing flanges. 4,511,417, Cl. 156-73.500.

Yeh, Yu S.: *See*—
Greenstein, Lawrence J.; and Yeh, Yu S., 4,512,034, Cl. 455-139.000.

Yeo, Denis, to Westinghouse Electric Corp. Welding nuclear reactor fuel rod end plugs. 4,511,075, Cl. 228-7.000.

Ying, Wei-chi: *See*—
Colaruotolo, Joseph F.; Irvine, Robert L.; Ketchum, Lloyd H., Jr.; and Ying, Wei-chi, 4,511,657, Cl. 435-253.000.

Yokoyama, Akira; Arano, Yasushi; and Hosotani, Takeo, to Nihon Medi-Physics Co., Ltd. 1-(p-Substituted or unsubstituted aminoalkyl)phenylpropane-1,2-dione bis(thiosemicarbazone) derivatives, and their production and use. 4,511,550, Cl. 424-1.100.

Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Small signal amplifying circuit for a pickup cartridge. 4,512,008, Cl. 369-134.000.

Yokoyama, Tatsuro: *See*—
Sakano, Isao; Yokoyama, Tatsuro; Kajiya, Seitaro; Okazaki, Yutaka; Tokuda, Hiroshi; Kawazura, Hiroshi; Kumakura, Mikio; Nakano, Takuo; and Awaya, Akira, 4,511,574, Cl. 514-371.000.

Yoneda, Takao; and Sakakibara, Yasuji, to Toyoda Koki Kabushiki Kaisha. Method of grinding a curved corner portion. 4,510,719, Cl. 51-289.00R.

Yonezu, Ikuo: *See*—
Sakai, Takashi; Honda, Naojiro; and Yonezu, Ikuo, 4,510,759, Cl. 62-48.000.

Yoo, Han S.; and Lee, Wha S., to Korea Advanced Institute of Science and Technology. Wholly aromatic or aliphatic aromatic block copolyamides and process therefor. 4,511,709, Cl. 528-331.000.

Yoon, Han S.; and Son, Tae W., to Korea Advanced Institute of Science and Technology, 200-43. Highly oriented aromatic polyamide short fiber. 4,511,623, Cl. 428-359.000.

Yoshida, Hiroshi; Matsuda, Yoshio; and Komeya, Akira, to Yoshida Kogyo K.K. Slide fastener assembly. 4,510,656, Cl. 24-390.000.

Yoshida Kogyo K. K.: *See*—
Asahi, Sadaho, 4,510,655, Cl. 24-382.000.
Matsumoto, Masao; and Imai, Shigeru, 4,510,662, Cl. 29-408.000.
Takahashi, Kihei, 4,510,658, Cl. 29-33.200.

Yoshida Kogyo K.K.: *See*—
Yoshida, Hiroshi; Matsuda, Yoshio; and Komeya, Akira, 4,510,656, Cl. 24-390.000.

Yoshida, Masatoshi; and Miyadera, Yasuo, to Hitachi Chemical Company. Process for producing a polyimide solution. 4,511,681, Cl. 523-310.000.

Yoshida, Ryo, to Daihatsu Motor Company Limited. Lockup control device for a torque converter. 4,510,747, Cl. 60-343.000.

Yoshida, Yoshinori: *See*—
Shinohara, Hironobu; Yamahara, Noboru; and Yoshida, Yoshinori, 4,511,683, Cl. 524-3.000.

Yoshihisa, Kozo; and Okui, Isamu, to Tokyo Shibaura Denki Kabushiki Kaisha. FM Pulse counting demodulator with multiplier for input and delayed input signals. 4,511,849, Cl. 329-103.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Tsukada, Takami; Akutsu, Masao; and Saito, Tadao, 4,511,418, Cl. 156-245.000.

Yoshiyama, Toshio: *See*—
Tsudaka, Hideaki; Washio, Takaji; Kozuka, Nobuhiko; Iseki, Masahide; Watanabe, Toshio; Kai, Masami; Yoshiyama, Toshio; and Sakata, Hiromi, 4,511,241, Cl. 355-14.0CU.

Young, Terry G., to Joy Manufacturing Company. Dual seal in-line test valve. 4,510,970, Cl. 137-625.400.

Younger, Dwen R. Trailer hitch guide assembly. 4,511,159, Cl. 280-477.000.

Ytron Dr. Karg GmbH: *See*—
Karg, Roland; and Sattelmaier, Helmut, 4,511,256, Cl. 366-165.000.

Yu, Simon H., to B. F. Goodrich Company, The. Extraction of oligomers from polymers of epihalohydrin. 4,511,742, Cl. 568-614.000.

Yudis, Donald W.; and Moody, Roy A. Tie strip. 4,510,649, Cl. 24-16.0PB.

Yuill, Grenville K., to Lion Industries Ltd. Method and apparatus for testing the air-tightness of a building using transient pressurization. 4,510,791, Cl. 73-40.000.

Yukawa, Akira, to Nippon Electric Co., Ltd. Voltage comparator circuit. 4,511,810, Cl. 307-355.000.

Yuki, Heimei; and Okamoto, Yoshio, to Daicel Chemical Industries, Ltd. Optically active polymer preparation and use. 4,511,475, Cl. 210-635.000.

Yumoto, Osamu: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,511,990, Cl. 364-748.000.

Zamboni, Alderino, to RISVIN - Ricerche e Sviluppo Industriale - S.r.l. Method of and apparatus for the handling of products by operative means carried in continuous movement. 4,511,027, Cl. 198-478.000.

Zambuto, Mauro: *See*—
McGovern, Paul A.; and Zambuto, Mauro, 4,511,247, Cl. 356-3.000.

Zenith Electronics Corporation: *See*—
Rajaram, Babu, 4,511,965, Cl. 364-200.000.

Zeyher, Fritz: *See*—
Fritz, Raimund; and Zeyher, Fritz, 4,510,844, Cl. 89-135.000.

Ziegler, Thomas K.: *See*—
Vella, Paul L., 4,510,770, Cl. 62-464.000.

Zilkha, Sasson: *See*—
Mayne, W. Harry; and Zilkha, Sasson, 4,512,001, Cl. 367-189.000.

Zincroksid S.p.A.: *See*—
Bruno, Roberto; and Memmi, Massimo, 4,511,633, Cl. 428-666.000.

Zlotnicki, Lucjan. Bridge launcher. 4,510,637, Cl. 14-2.400.

Zoss, Robert: *See*—
Olson, Sharon; and Zoss, Robert, 4,511,583, Cl. 426-89.000.

Zymark Corporation: *See*—
Hutchins, Burleigh M.; and Abrahams, Louis, 4,510,684, Cl. 29-703.000.

Zysset, Edgar H., to Automated Container Corporation. Pull-tab forming method. 4,511,299, Cl. 413-12.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF APRIL, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Australian Merino Wool Harvesting Ltd.: *See*—
Lines, Lancelot H.; and Baxter, John R., Re. 31,866, Cl. 128-419.00R.

Baxter, John R.: *See*—
Lines, Lancelot H.; and Baxter, John R., Re. 31,866, Cl. 128-419.00R.

Beasley, John K.; Beckerbauer, Richard; Schleinitz, Henry M.; and Wilson, Frank C., to Mitsubishi Rayon Co., Ltd. Low attenuation optical fiber of deuterated polymer. Re. 31,868, Cl. 350-96.300.

Beckerbauer, Richard: *See*—
Beasley, John K.; Beckerbauer, Richard; Schleinitz, Henry M.; and Wilson, Frank C., Re. 31,868, Cl. 350-96.300.

Kennon, James L., to Nordson Corporation. Electrostatic spray gun. Re. 31,867, Cl. 239-3.000.

Lines, Lancelot H.; and Baxter, John R., to Senil Nominees Pty. Ltd.; and Australian Merino Wool Harvesting Ltd. Immobilizing animals. Re. 31,866, Cl. 128-419.00R.

Mitsubishi Rayon Co., Ltd.: *See*—
Beasley, John K.; Beckerbauer, Richard; Schleinitz, Henry M.; and Wilson, Frank C., Re. 31,868, Cl. 350-96.300.

Nordson Corporation: *See*—
Kennon, James L., Re. 31,867, Cl. 239-3.000.

Roux, Christiane. Artificial joints, in particular coxo-femoral joints. Re. 31,865, Cl. 3-1.912.

Schleinitz, Henry M.: *See*—
Beasley, John K.; Beckerbauer, Richard; Schleinitz, Henry M.; and Wilson, Frank C., Re. 31,868, Cl. 350-96.300.

Senil Nominees Pty. Ltd.: *See*—
Lines, Lancelot H.; and Baxter, John R., Re. 31,866, Cl. 128-419.00R.

Wilson, Frank C.: *See*—
Beasley, John K.; Beckerbauer, Richard; Schleinitz, Henry M.; and Wilson, Frank C., Re. 31,868, Cl. 350-96.300.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Anthony Manufacturing Company: *See*—
Ray, Charles A.; and Kent, John L., B1 4,316,579, Cl. 239-123.000.

Basilone, Anthony J.: *See*—
Sivertz, Christian; and Basilone, Anthony J., B1 3,963,842, Cl. 427-305.000.

Christenson, Roger M., to Pittsburgh Plate Glass Company. Water-insoluble condensation products of aldehydes and acrylamide interpolymers. B1 2,978,437, 4-16-85, Cl. 525-163.000.

Christenson, Roger M., to Pittsburgh Plate Glass Company. Resinous materials. B1 3,037,963, 4-16-85, Cl. 525-154.000.

Fankhauser, Peter: *See*—
Witschi, Heinz; and Fankhauser, Peter, B1 4,338,757, Cl. 52-699.000.

Kent, John L.: *See*—
Ray, Charles A.; and Kent, John L., B1 4,316,579, Cl. 239-123.000.

Korex Company, The: *See*—
Porasik, Paul A., B1 4,427,417, Cl. 23-313.00R.

London Laboratories Limited Co.: *See*—
Sivertz, Christian; and Basilone, Anthony J., B1 3,963,842, Cl. 427-305.000.

Nye, Alice W. Output commode pan. B1 3,654,638, 4-16-85, Cl. 4-144.100.

Papst, Hermann, to Papst-Motoren KG. Soundproofed housing for electric motors. B1 3,527,969, 4-16-85, Cl. 310-51.000.

Papst-Motoren KG: *See*—
Papst, Hermann, B1 3,527,969, Cl. 310-51.000.

Pittsburgh Plate Glass Company: *See*—
Christenson, Roger M., B1 2,978,437, Cl. 525-163.000.
Christenson, Roger M., B1 3,037,963, Cl. 525-154.000.

Porasik, Paul A., to Korex Company, The. Process for preparing detergent compositions containing hydrated inorganic salts. B1 4,427,417, 4-16-85, Cl. 23-313.00R.

Ray, Charles A.; and Kent, John L., to Anthony Manufacturing Company. Multi-purpose seal for pop-up sprinkler. B1 4,316,579, 4-16-85, Cl. 239-123.000.

Sivertz, Christian; and Basilone, Anthony J., to London Laboratories Limited Co. Deposition of copper. B1 3,963,842, 4-16-85, Cl. 427-305.000.

Witschi, Heinz; and Fankhauser, Peter. Device for connecting a structure with a wall to be poured with concrete. B1 4,338,757, 4-16-85, Cl. 52-699.000.

LIST OF DESIGN PATENTEES

Adelaide Brighton Cement Limited: *See*—
Schroder, Ernest W.; and Pickford, David A., 278,457, Cl. D23-2.000.

American Telecommunications Corporation: *See*—
Perkins, George D., 278,433, Cl. D14-53.000.

Assez, Pierre J. G., to Durobor Societe Anonyme. Goblet. 278,401, 4-16-85, Cl. D7-13.000.

Bailey, Dennis J., to Bailey, Dennis James. Wheelchair tire cleaner. 278,390, 4-16-85, Cl. D4-129.000.

Bailey, Dennis James: *See*—
Bailey, Dennis J., 278,390, Cl. D4-129.000.

Barlik, Richard: *See*—
Knight, Elizabeth; and Barlik, Richard, 278,448, Cl. D21-116.000.

Baus, Andre E. J., to Goodyear Tire & Rubber Company, The. Tire. 278,423, 4-16-85, Cl. D12-147.000.

Bayly, Peter K., to Roplas Pty. Ltd. Reclining lounge chair or similar article. 278,392, 4-16-85, Cl. D6-361.000.

Beard, Kenneth K. Acoustic reflector headset. 278,431, 4-16-85, Cl. D14-36.000.

Bedel, Denis E., to North American Philips Electric Corp. Air-cooled compact electric lamp. 278,462, 4-16-85, Cl. D26-3.000.

Bergman, Andrew I.: *See*—
Kujawski, Stanley M.; and Bergman, Andrew I., 278,446, Cl. D21-63.000.

Birchenall, Richard W. Combined bottle opener with shot measurer. 278,405, 4-16-85, Cl. D8-34.000.

Bixler, George, to Thompson, Nellie. Illuminated cane. 278,387, 4-16-85, Cl. D3-7.000.

Brooks, Robert. Combined fire hose and cabinet therefor. 278,464, 4-16-85, Cl. D29-2.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Morishita, Masayuki, 278,404, Cl. D18-1.000.
Morishita, Masayuki, 278,443, Cl. D18-1.000.

Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., to Simmons Universal Corporation. Crib footboard. 278,398, 4-16-85, Cl. D6-505.000.

Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., to Simmons Universal Corporation. Crib footboard. 278,399, 4-16-85, Cl. D6-505.000.

Buck, Marshall D., to Cerwin-Vega, Inc. Grille assembly for a coaxial loudspeaker. 278,432, 4-16-85, Cl. D14-39.000.

Carbajales Santa-Eulalia, Javier B.: *See*—
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 278,421, Cl. D11-162.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a quail. 278,421, 4-16-85, Cl. D11-162.000.

Carlsen, Soren: *See*—
Reitzel, Povl; and Carlsen, Soren, 278,411, Cl. D9-403.000.

Caton, Robert W.: *See*—
Eckstedt, Paul D.; and Caton, Robert W., 278,427, Cl. D13-12.000.

Cerwin-Vega, Inc.: *See*—
Buck, Marshall D., 278,432, Cl. D14-39.000.

Cesaroni, William C., to Dart Industries Inc. Electric skillet. 278,403, 4-16-85, Cl. D7-360.000.

Chadiam Diamond Mfg., Inc.: *See*—
Nejman, Daniel, 278,418, Cl. D11-90.000.

Chaussures Mephisto S.A.: *See*—
Michaeli, Martin, 278,383, Cl. D2-320.000.

Chen, York, to Y. Chen & Co., Ltd. Golf shoe sole. 278,382, 4-16-85, Cl. D2-320.000.

Cho, Joong H. Bottle cap for edible oil. 278,414, 4-16-85, Cl. D9-446.000.

Colgate-Palmolive Company: *See*—
Reitzel, Povl; and Carlsen, Soren, 278,411, Cl. D9-403.000.

Colquitt, Lester M. Model racing car. 278,449, 4-16-85, Cl. D21-137.000.

Cook International, Inc.: *See*—
Hill, James J., 278,419, Cl. D11-121.000.

Cook, Ronald E. Sink strainer. 278,459, 4-16-85, Cl. D23-42.000.

Dart Industries Inc.: *See*—
Cesaroni, William C., 278,403, Cl. D7-360.000.

Doodson, Peter J.; and Joosten, Stefanus F. W., to U.S. Philips Corporation. Dictating machine. 278,429, 4-16-85, Cl. D14-3.000.

Draheim, Harvey J.: *See*—
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 278,398, Cl. D6-505.000.
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 278,399, Cl. D6-505.000.

Durobor Societe Anonyme: *See*—
Assez, Pierre J. G., 278,401, Cl. D7-13.000.

Eckstedt, Paul D.; and Caton, Robert W., to FMC Corporation. Pump interface. 278,427, 4-16-85, Cl. D13-12.000.

Englishtown Sportswear, Ltd.: *See*—
Heinfling, Martin, 278,375, Cl. D2-28.000.
Heinfling, Martin, 278,376, Cl. D2-28.000.
Heinfling, Martin, 278,377, Cl. D2-28.000.
Heinfling, Martin, 278,378, Cl. D2-28.000.
Heinfling, Martin, 278,379, Cl. D2-28.000.

Everitt, Delmar K.: *See*—
Goldfarb, Adolph E.; and Everitt, Delmar K., 278,450, Cl. D21-141.000.

Fenne, Kenneth R., to Pittway Corporation. Wall timer. 278,415, 4-16-85, Cl. D10-40.000.

Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, to Hirsh Company. Router table. 278,440, 4-16-85, Cl. D15-141.000.

Fleischer, William B., Jr., to Upneumat International, Inc. Portable pneumatic tool housing. 278,407, 4-16-85, Cl. D8-61.000.

FMC Corporation: *See*—
Eckstedt, Paul D.; and Caton, Robert W., 278,427, Cl. D13-12.000.

Frankenreiter, Anthony. Storage chest for sports and other personal accessories. 278,397, 4-16-85, Cl. D6-440.000.

Fuji Co., Ltd.: *See*—
Ueda, Taichi, 278,388, Cl. D3-71.000.

General Foods Corporation: *See*—
Woodcock, Charles M.; and Kliment, Randy, 278,413, Cl. D9-446.000.

Giugiaro, Giorgetto, to Necchi S.p.A. Sewing machine. 278,438, 4-16-85, Cl. D15-70.000.

Goetz, George E.; and McNutt, Robin E. Combined plate and frame stand. 278,394, 4-16-85, Cl. D6-310.000.

Goldfarb, Adolph E.; and Everitt, Delmar K., to Goldfarb, Adolph E. Wheel for toy amphibious vehicle. 278,450, 4-16-85, Cl. D21-141.000.

Goldman, Jerome; Goldman, Marvin; Philips, Gerald; and Pesin, Joseph, to Penn Plax Plastics. Aquarium ornament. 278,465, 4-16-85, Cl. D30-12.000.

Goldman, Marvin: *See*—
Goldman, Jerome; Goldman, Marvin; Philips, Gerald; and Pesin, Joseph, 278,465, Cl. D30-12.000.

Goodyear Tire & Rubber Company, The: *See*—
Baus, Andre E. J., 278,423, Cl. D12-147.000.

Greater Toronto Food Corporation: *See*—
Palmer, Robert A., 278,409, Cl. D9-316.000.

GTE Communication Systems Corporation: *See*—
Nestell, Bengt A., 278,434, Cl. D14-60.000.

Hakoda, Kouzou, to Ryobi Limited. Cutter. 278,439, 4-16-85, Cl. D15-127.000.

Hama Hamaphot KG Hanke & Thomas: *See*—
Hanke, Rudolph, 278,441, Cl. D16-40.000.

Hanke, Rudolph, to Hama Hamaphot KG Hanke & Thomas. Film cutting apparatus. 278,441, 4-16-85, Cl. D16-40.000.

Hartney, Sheryl J., to Saab-Scania of America, Inc. Document organizer. 278,445, 4-16-85, Cl. D19-26.000.

Hasbro Industries, Inc.: *See*—
Knight, Elizabeth; and Barlik, Richard, 278,448, Cl. D21-116.000.

Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 278,375, 4-16-85, Cl. D2-28.000.

Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 278,376, 4-16-85, Cl. D2-28.000.

Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 278,377, 4-16-85, Cl. D2-28.000.

Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 278,378, 4-16-85, Cl. D2-28.000.

Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 278,379, 4-16-85, Cl. D2-28.000.

Hikawa, Koji, to Ricoh Company, Ltd. I/O Terminal for data communication. 278,435, 4-16-85, Cl. D14-101.000.

Hill, James J., to Cook International, Inc. Christmas tree ornament. 278,419, 4-16-85, Cl. D11-121.000.

Hirsh Company: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 278,440, Cl. D15-141.000.

Honda Gikken Kogyo Kabushiki Kaisha: *See*—
Toshihiko, Shibuya, 278,425, Cl. D13-1.000.

Huber, Peter M., legal representative: *See*—
Trotman, Helen H., deceased; Huber, Peter M., legal representative; and Trotman, Herbert H., 278,468, Cl. D92-1.100.

Husqvarna Aktiebolag: *See*—
Rosenblad, Lars G., 278,437, Cl. D15-68.000.

Idea Works! The: *See*—
Wilson, Michael C., 278,384, Cl. D2-360.000.

Ikeda, Shuichi: *See*—
Matsubara, Masaki; and Ikeda, Shuichi, 278,410, Cl. D9-403.000.

Ito, Kenichi: *See*—
Tsuchihashi, Yasutaka; and Ito, Kenichi, 278,428, Cl. D14-1.000.

Jack Carmichael Advertising, Inc.: *See*—
Saari, Timothy J., 278,381, Cl. D2-244.000.

John J. Madison Company, Inc.: *See*—
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 278,421, Cl. D11-162.000.

Joosten, Stefanus F. W.: *See*—
Doodson, Peter J.; and Joosten, Stefanus F. W., 278,429, Cl. D14-3.000.

Keeler, Robert A., to Steelcase Inc. Partition unit. 278,395, 4-16-85, Cl. D6-332.000.

Kern, Dannie R. L. Camper rack for holding skis and the like. 278,424, 4-16-85, Cl. D12-157.000.

Kimball, Anthony. Portable fire draft maker or similar article. 278,460, 4-16-85, Cl. D23-90.100.

Kircher, William B.; and Lester, David A., to North Fork Industries, Inc. Combined creel and game bag. 278,389, 4-16-85, Cl. D2-38.000.

Kjellen, Maud K. H., to Kjellen, Maud K. H. Belt. 278,385, 4-16-85, Cl. D2-380.000.

Kliment, Randy: *See*—
Woodcock, Charles M.; and Kliment, Randy, 278,413, Cl. D9-446.000.

Knight, Elizabeth; and Barlik, Richard, to Hasbro Industries, Inc. Toy stable. 278,448, 4-16-85, Cl. D21-116.000.

Koper, Barry R. Facial appliance for makeup. 278,453, 4-16-85, Cl. D21-190.000.

Koper, Barry R. Facial appliance for makeup. 278,454, 4-16-85, Cl. D21-190.000.

Koziol, Stephan. Bottle-opener. 278,406, 4-16-85, Cl. D8-38.000.

Kujawski, Stanley M.; and Bergman, Andrew I., to Quaker Oats Company, The. Action mobile. 278,446, 4-16-85, Cl. D21-63.000.

Kyushu Matsushita Electric Co., Ltd.: *See*—
Miyamoto, Ishin; Nagamatsu, Yasuo; Moriyama, Toshiya; and Sakamoto, Masaharu, 278,444, Cl. D18-1.000.

Lanci, Dennis M.; and Peters, Larry J., to Physio-Control Corporation. Battery charger. 278,426, 4-16-85, Cl. D13-5.000.

Lang, Harry J. Saddle Cover. 278,467, 4-16-85, Cl. D30-19.000.

Lester, David A.: *See*—
Kircher, William B.; and Lester, David A., 278,389, Cl. D2-38.000.

Lewis, Frederick F. Game carrying strap assembly having plural loop ended straps. 278,456, 4-16-85, Cl. D22-13.000.

Lewis, Maxwell P. Gemless ring. 278,417, 4-16-85, Cl. D11-27.000.

Makhoulian, Paul B. Toy rifle. 278,451, 4-16-85, Cl. D21-145.000.

Makhoulian, Paul B. Toy gun. 278,452, 4-16-85, Cl. D21-145.000.

Matsubara, Masaki; and Ikeda, Shuichi, to Shiseido Company Ltd. Cosmetic bottle. 278,410, 4-16-85, Cl. D9-403.000.

McNutt, Robin E.: *See*—
Goetz, George E.; and McNutt, Robin E., 278,394, Cl. D6-310.000.

Michaeli, Martin, to Chaussures Mephisto S.A. Shoe sole. 278,383, 4-16-85, Cl. D2-320.000.

Miyamoto, Ishin; Nagamatsu, Yasuo; Moriyama, Toshiya; and Sakamoto, Masaharu, to Kyushu Matsushita Electric Co., Ltd. Typewriter. 278,444, 4-16-85, Cl. D18-1.000.

Moran, Thomas F. Barricade. 278,416, 4-16-85, Cl. D10-109.000.

Morishita, Masayuki, to Brother Kogyo Kabushiki Kaisha. Typewriter. 278,404, 4-16-85, Cl. D18-1.000.

Morishita, Masayuki, to Brother Kogyo Kabushiki Kaisha. Typewriter. 278,443, 4-16-85, Cl. D18-1.000.

Moriyama, Toshiya: *See*—
Miyamoto, Ishin; Nagamatsu, Yasuo; Moriyama, Toshiya; and Sakamoto, Masaharu, 278,444, Cl. D18-1.000.

Murakami, Tsuyoshi, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Motortricycle. 278,422, 4-16-85, Cl. D12-110.000.

Nagamatsu, Yasuo: *See*—
Miyamoto, Ishin; Nagamatsu, Yasuo; Moriyama, Toshiya; and Sakamoto, Masaharu, 278,444, Cl. D18-1.000.

Necchi S.p.A.: *See*—
Giugiaro, Giorgetto, 278,438, Cl. D15-70.000.

Nejman, Daniel, to Chadiam Diamond Mfg., Inc. Precious, semiprecious or synthetic cut stone. 278,418, 4-16-85, Cl. D11-90.000.

Nestell, Bengt A., to GTE Communication Systems Corporation. Wireless telephone system base unit or the like. 278,434, 4-16-85, Cl. D14-60.000.

North American Philips Electric Corp.: *See*—
Bedel, Denis E., 278,462, Cl. D26-3.000.

North Fork Industries, Inc.: *See*—
Kircher, William B.; and Lester, David A., 278,389, Cl. D2-38.000.

Nosek, Robert J. Arm weight or similar article. 278,455, 4-16-85, Cl. D21-196.000.

Olympus Optical Co., Ltd.: *See*—
Tsuchihashi, Yasutaka; and Ito, Kenichi, 278,428, Cl. D14-1.000.

Palmer, Robert A., to Greater Toronto Food Corporation. Bottle. 278,409, 4-16-85, Cl. D9-316.000.

Paul Associates: *See*—
Paul, Stanley M., 278,458, Cl. D23-25.000.

Paul, Stanley M., to Paul Associates. Faucet set. 278,458, 4-16-85, Cl. D23-25.000.

Penn Plax Plastics: *See*—
Goldman, Jerome; Goldman, Marvin; Philips, Gerald; and Pesin, Joseph, 278,465, Cl. D30-12.000.

Pepall, Lynford S., to U.S. Philips Corporation. Sun lamp. 278,461, 4-16-85, Cl. D24-68.000.

Perkins, George D., to American Telecommunications Corporation. Telephone. 278,433, 4-16-85, Cl. D14-53.000.

Pesin, Joseph: *See*—
Goldman, Jerome; Goldman, Marvin; Philips, Gerald; and Pesin, Joseph, 278,465, Cl. D30-12.000.

Peters, Larry J.: *See*—
Lanci, Dennis M.; and Peters, Larry J., 278,426, Cl. D13-5.000.

Peterson, Michael: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 278,440, Cl. D15-141.000.

Philips, Gerald: *See*—
Goldman, Jerome; Goldman, Marvin; Philips, Gerald; and Pesin, Joseph, 278,465, Cl. D30-12.000.

Physio-Control Corporation: *See*—
Lanci, Dennis M.; and Peters, Larry J., 278,426, Cl. D13-5.000.

Pickford, David A.: *See*—
Schroder, Ernest W.; and Pickford, David A., 278,457, Cl. D23-2.000.

Pittway Corporation: *See*—
Fenne, Kenneth R., 278,415, Cl. D10-40.000.

Platner, Warren. Chair. 278,391, 4-16-85, Cl. D6-366.000.

Platner, Warren. Arm chair. 278,393, 4-16-85, Cl. D6-374.000.

Quaker Oats Company, The: *See*—
Kujawski, Stanley M.; and Bergman, Andrew I., 278,446, Cl. D21-63.000.

Reichard, Stella P. Bottle spoon. 278,402, 4-16-85, Cl. D7-104.000.

Reitzel, Povl; and Carlsen, Soren, to Colgate-Palmolive Company. Bottle. 278,411, 4-16-85, Cl. D9-403.000.

Ricoh Company, Ltd.: *See*—
Hikawa, Koji, 278,435, Cl. D14-101.000.

Robinson, David W.: *See*—
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 278,398, Cl. D6-505.000.
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 278,399, Cl. D6-505.000.

Roplas Pty. Ltd.: *See*—
Bayly, Peter K., 278,392, Cl. D6-361.000.

Rosenblad, Lars G., to Husqvarna Aktiebolag. Sewing machine. 278,437, 4-16-85, Cl. D15-68.000.

Ross, Edward E. Combined mailbox and signal. 278,469, 4-16-85, Cl. D99-29.000.

Royston Manufacturing Corporation: *See*—
Suttles, James M., 278,400, Cl. D6-553.000.

Ryobi Limited: *See*—
Hakoda, Kouzou, 278,439, Cl. D15-127.000.

Saab-Scania of America, Inc.: *See*—
Hartney, Sheryl J., 278,445, Cl. D19-26.000.

Saari, Timothy J., to Jack Carmichael Advertising, Inc. Inflatable dome hat. 278,381, 4-16-85, Cl. D2-244.000.

Sakamoto, Masaharu: *See*—
Miyamoto, Ishin; Nagamatsu, Yasuo; Moriyama, Toshiya; and Sakamoto, Masaharu, 278,444, Cl. D18-1.000.

Schroder, Ernest W.; and Pickford, David A., to Adelaide Brighton Cement Limited. Transportable bulk container. 278,457, 4-16-85, Cl. D23-2.000.

Shampang, Joseph A. Cutting tool holder. 278,408, 4-16-85, Cl. D8-98.000.

Share, Seymour J. Battery pack belt. 278,386, 4-16-85, Cl. D2-383.000.

Shiseido Company Ltd.: *See*—
Matsubara, Masaki; and Ikeda, Shuichi, 278,410, Cl. D9-403.000.

Simmons Universal Corporation: *See*—
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 278,398, Cl. D6-505.000.
Brunner, Merlin A.; Robinson, David W.; and Draheim, Harvey J., 278,399, Cl. D6-505.000.

Smith, Vance R.: *See*—
Syme, Duncan C.; Smith, Vance R.; and Tyrol, Brian J., 278,396, Cl. D6-370.000.

Solomon, Arieh. Toy vehicle. 278,447, 4-16-85, Cl. D21-76.000.

Springer, Robert H. Bird feeder. 278,466, 4-16-85, Cl. D30-15.000.

Steelcase Inc.: *See*—
Keeler, Robert A., 278,395, Cl. D6-332.000.

Storlie, John W. Lift hitch pin. 278,436, 4-16-85, Cl. D15-28.000.

Sunlux Best Group, USA, Inc.: *See*—
Yeung, Yat K., 278,412, Cl. D9-420.000.

Suttles, James M., to Royston Manufacturing Corporation. Outdoor telephone booth. 278,400, 4-16-85, Cl. D6-553.000.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Murakami, Tsuyoshi, 278,422, Cl. D12-110.000.

Sylvan, Richard: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 278,440, Cl. D15-141.000.

Syme, Duncan C.; Smith, Vance R.; and Tyrol, Brian J., to Vermont Castings, Inc. Park bench. 278,396, 4-16-85, Cl. D6-370.000.

Thompson, Lawrence E. Illuminated picture box. 278,420, 4-16-85, Cl. D11-136.000.

Thompson, Nellie: *See*—
Bixler, George, 278,387, Cl. D3-7.000.

Toshihiko, Shibuya, to Honda Gikken Kogyo Kabushiki Kaisha. Power generator. 278,425, 4-16-85, Cl. D13-1.000.

Trotman, Helen H., deceased; by Huber, Peter M., legal representative; and Trotman, Herbert H. Plastic sheet material or the like. 278,468, 4-16-85, Cl. D92-1.100.

Trotman, Herbert H.: *See*—
Trotman, Helen H., deceased; Huber, Peter M., legal representative; and Trotman, Herbert H., 278,468, Cl. D92-1.100.

Tsuchihashi, Yasutaka; and Ito, Kenichi, to Olympus Optical Co., Ltd. Optical read out pickup for use in an optical audio disc machine or the like. 278,428, 4-16-85, Cl. D14-1.000.

Tyrol, Brian J.: *See*—
Syme, Duncan C.; Smith, Vance R.; and Tyrol, Brian J., 278,396, Cl. D6-370.000.

Ueda, Taichi, to Fuji Co., Ltd. Pouch. 278,388, 4-16-85, Cl. D3-71.000.

U.S. Philips Corporation: *See*—
Doodson, Peter J.; and Joosten, Stefanus F. W., 278,429, Cl. D14-3.000.
Pepall, Lynford S., 278,461, Cl. D24-68.000.
van de Poel, Rebertus, 278,430, Cl. D14-5.000.

Upneumat International, Inc.: *See*—
Fleischer, William B., Jr., 278,407, Cl. D8-61.000.

van de Poel, Rebertus, to U.S. Philips Corporation. Combined automobile tape player and radio receiver. 278,430, 4-16-85, Cl. D14-5.000.

Verdick, Barbara J. Beard bib. 278,380, 4-16-85, Cl. D2-234.000.

Vermont Castings, Inc.: *See*—
Syme, Duncan C.; Smith, Vance R.; and Tyrol, Brian J., 278,396, Cl. D6-370.000.

Vest, Gary W. Fluorescent light ballast receptacle with integral wall plug. 278,463, 4-16-85, Cl. D26-113.000.

Whomsley, Roxane L. Stringed instrument cover. 278,442, 4-16-85, Cl. D17-20.000.

Wilson, Michael C., to Idea Works! The. Combined sweatband and mirror. 278,384, 4-16-85, Cl. D2-360.000.

Woodcock, Charles M.; and Kliment, Randy, to General Foods Corporation. Dispensing closure. 278,413, 4-16-85, Cl. D9-446.000.

Y. Chen & Co., Ltd.: *See*—
Chen, York, 278,382, Cl. D2-320.000.

Yeung, Yat K., to Sunlux Best Group, USA, Inc. Food container. 278,412, 4-16-85, Cl. D9-420.000.

LIST OF PLANT PATENTEES

Barberet, Nicole; and Ducloux, Yves, to Laboratoire de Physiologie Vegetale de La Londe. Carnation named Londonie. 5,439, 4-16-85, Cl. 73.000.

Bennett, Cecelia Lucy Daphne: *See*—
Strawn, Leslie E., 5,436, Cl. 8.000.

Bennett, Cecilia L. D. Miniature rose plant. 5,437, 4-16-85, Cl. 9.000.

Bradford, Norman G. Nectarine tree - Early Diamond. 5,438, 4-16-85, Cl. 41.000.

Ducloux, Yves: *See*—
Barberet, Nicole; and Ducloux, Yves, 5,439, Cl. 73.000.

Duffett, William E.; and Mack, Grace H., to Mack, Grace H. Chrysanthemum plant named Ballerina. 5,440, 4-16-85, Cl. 77.000.

Duffett, William E.; and Mack, Grace H., to Mack, Grace H. Chrysanthemum plant named Camelot. 5,441, 4-16-85, Cl. 80.000.

Laboratoire de Physiologie Vegetale de La Londe: *See*—
Barberet, Nicole; and Ducloux, Yves, 5,439, Cl. 73.000.

Mack, Grace H.: *See*—
Duffett, William E.; and Mack, Grace H., 5,440, Cl. 77.000.
Duffett, William E.; and Mack, Grace H., 5,441, Cl. 80.000.

Strawn, Leslie E., to Bennett, Cecelia Lucy Daphne. Cottontail—Miniature rose plant. 5,436, 4-16-85, Cl. 8.000.

CLASSIFICATION OF PATENTS

ISSUED APRIL 16, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

8 4,510,625
115 4,510,626

CLASS 3

1 4,510,627
1.5 4,510,628
1.912 Re.31,865

CLASS 4

144.1 B1 3,654,638
332 4,510,629
443 4,510,630
478 4,510,631
488 4,510,632

CLASS 5

81 R 4,510,633
98 B 4,510,634
247 4,510,635

CLASS 8

405 4,511,360
471 4,511,361

CLASS 12

1 R 4,510,636

CLASS 14

2.4 4,510,637
71.7 4,510,638

CLASS 15

53 AB 4,510,639
104 A 4,510,640
118 4,510,641
231 4,510,642
320 4,510,643

CLASS 17

64 4,510,644

CLASS 19

0.25 4,510,645
80 R 4,510,646
105 4,510,647
266 4,510,648

CLASS 23

313 R B1 4,427,417

CLASS 24

16 PB 4,510,649
4,510,650
68 CD 4,510,652
68 R 4,510,651
131 C 4,510,653
344 4,510,654
382 4,510,655
390 4,510,656

CLASS 28

100 4,510,657

CLASS 29

33.2 4,510,658
156.8 R 4,510,659
157.3 D 4,510,660
259 4,510,661
408 4,510,662
429 4,510,663
450 4,510,664
460 4,510,665
511 4,510,666
526 R 4,510,667
561 4,510,668
568 4,510,669
571 4,510,670
4,510,671
574 4,510,672
4,510,673
4,510,674
4,510,675
577 C 4,510,676
588 4,510,677
590 4,510,678
598 4,510,679
4,510,680
623.1 4,510,681
4,510,682
701 4,510,683
703 4,510,684
837 4,510,685
838 4,510,686

CLASS 30

34.2 4,510,687
294 4,510,688
347 4,510,689

CLASS 33

126.7 R 4,510,690
169 R 4,510,691
174 G 4,510,692
174 L 4,510,693
203.18 4,510,694
293 4,510,695
304 4,510,696

CLASS 34

1 4,510,697
117 4,510,698

CLASS 36

43 4,510,699
44 4,510,700
68 4,510,701
86 4,510,702
119 4,510,703
136 4,510,704

CLASS 37

54 4,510,705
64 4,510,706

CLASS 40

152 4,510,707
361 4,510,708

CLASS 43

17 4,510,709
42.13 4,510,710
137 4,510,711

CLASS 44

1 G 4,511,363
1 SR 4,511,362
51 4,511,364
51' 4,511,365
53 4,511,366
4,511,367
4,511,368
62 4,511,369

CLASS 47

66 4,510,712

CLASS 48

197 A 4,511,370
197 R 4,511,371
4,511,372

CLASS 49

175 4,510,713
249 4,510,714
488 4,510,715

CLASS 51

5 D 4,510,716
34 J 4,510,720
58 4,510,717
170 EB 4,510,718
289 R 4,510,719
298 4,511,373

CLASS 52

40 4,510,721
213 4,510,722
223 R 4,510,723
233 4,510,724
309.1 4,510,725
309.8 4,510,726
508 4,510,727
514 4,510,728
699 B1 4,338,757
741 4,510,729

CLASS 53

53 4,510,730
66 4,510,731
168 4,510,732
434 4,510,733
449 4,510,734
464 4,510,735
567 4,510,736
570 4,510,737

CLASS 55

20 4,511,374
28 4,511,375
36 4,511,376
163 4,511,377
208 4,511,378
238 4,511,379
355 4,511,380

CLASS 56

12.8 4,510,738
17.5 4,510,739
27.5 4,510,740
341 4,510,741
384 4,510,742

CLASS 57

260 4,510,743
280 4,510,744
415 4,510,745

CLASS 59

79.1 4,510,746

CLASS 60

39.02 4,510,748
286 4,510,749
343 4,510,747
443 4,510,750
450 4,510,751
562 4,510,752
578 4,510,753
602 4,510,754
657 4,510,755
659 4,510,756
667 4,510,757

CLASS 62

17 4,511,381
20 4,511,382
45 4,510,758
48 4,510,759
49 4,510,760
73 4,510,761
79 4,510,762
115 4,510,763
133 4,510,764
154 4,510,765
171 4,510,766
200 4,510,767
320 4,510,768
457 4,510,769
464 4,510,770
514 R 4,510,771

CLASS 63

12 4,510,772

CLASS 65

6 4,511,383
114 4,511,384
135 4,511,385
273 4,511,386
287 4,511,387

CLASS 66

9 B 4,510,773
75.2 4,510,774
77 4,510,775

CLASS 68

3 R 4,510,776
12 R 4,510,777
4,510,778

CLASS 70

208 4,510,779

CLASS 71

34 4,511,388
54 4,511,389
88 4,511,390
4,511,391
90 4,511,392
92 4,511,393
105 4,511,394
121 4,511,395

CLASS 72

57 4,510,780
105 4,510,781
142 4,510,782
200 4,510,783
201 4,510,784
323 4,510,785
326 4,510,786
368 4,510,787
377 4,510,788
442 4,510,789
457 4,510,790

CLASS 73

37.9 4,510,805
40 4,510,791
40.7 4,510,792
86 4,510,793
116 4,510,794
118 4,510,795
119 A 4,510,796
150 R 4,510,798
151 4,510,797
4,510,799
153 4,510,800
4,510,801
178 R 4,510,803
290 V 4,510,804
432 R 4,510,806
4,510,807
433 4,510,808
457 4,510,809
505 4,510,802
606 4,510,810
611 4,510,811
644 4,510,812
766 4,510,813
862.57 4,510,814

CLASS 74

61 4,510,815
372 4,510,816
474 4,510,820
477 4,510,817
4,510,818
4,510,819
552 4,510,821
733 4,510,822
789 4,510,823

CLASS 75

51.1 4,511,396
59.17 4,511,397
63 4,511,398
84.5 4,511,399
129 4,511,400
130 R 4,511,401
233 4,511,402

CLASS 76

86 4,510,824

CLASS 81

9.4 4,510,827
57.29 4,510,825
57.37 4,510,826

CLASS 82

4 A 4,510,828
36 R 4,510,829

CLASS 83

114 4,510,830
157 4,510,831
168 4,510,832
176 4,510,841
205 4,510,833
453 4,510,834
471.2 4,510,835

CLASS 84

1.26 4,510,836
184 4,510,837
422 R 4,510,838
434 4,510,839
477 R 4,510,840

CLASS 86

25 4,510,842

CLASS 89

14.4 4,510,843
135 4,510,844

CLASS 91

180 4,510,845
460 4,510,846
461 4,510,847
4,510,848
515 4,510,849

CLASS 92

125 4,510,850

CLASS 98

42.08 4,510,851
94.2 4,510,852

CLASS 99

286 4,510,853
337 4,510,854
450 4,510,855
457 4,510,856

CLASS 100

35 4,510,858
4,510,859
49 4,510,860
53 4,510,857
88 4,510,861

CLASS 101

93.14 4,510,862
119 4,510,863
123 4,510,864
153 4,510,865
365 4,510,866
4,510,867
415.1 4,510,868

CLASS 102

240 4,510,869
307 4,510,870

CLASS 105

167 4,510,871

CLASS 106

1.22 4,511,403
14.12 4,511,404
15.05 4,511,405
18.14 4,511,406

CLASS 108

25 4,510,872

CLASS 110

289 4,510,873
347 4,510,874

CLASS 112

121.12 4,510,875
262.1 4,510,876

CLASS 114

45 4,510,877
54 4,510,878
162 4,510,879
4,510,880
270 4,510,881

CLASS 118

300 4,510,882
305 4,510,883
405 4,510,884
674 4,510,885

CLASS 119

82 4,510,886
95 4,510,887
143 4,510,888
159 4,510,889

CLASS 122

17 4,510,890
32 4,510,891
510 4,510,892

CLASS 123

41.02 4,510,893
48 B 4,510,895
48 R 4,510,894
52 MB 4,510,896
90.48 4,510,897
192 R 4,510,898
198 D 4,510,899
321 4,510,900
325 4,510,901
4,510,902
339 4,510,903
4,510,904
360 4,510,905
396 4,510,906
435 4,510,907
449 4,510,908
470 4,510,909
486 4,510,910
493 4,510,911
525 4,510,912
557 4,510,913
590 4,510,914
620 4,510,915

CLASS 126

25 B 4,510,916
76 4,510,917
79 4,510,918
263 4,510,919
415 4,510,920
429 4,510,921
435 4,510,922
438 4,510,923

CLASS 128

1.2 4,510,924
1.3 4,510,925
20 4,510,926
80 H 4,510,927
94 4,510,928
200.14 4,510,929
202.22 4,510,930
202.28 4,510,931
204.29 4,510,932
207.14 4,510,933
335.5 4,510,934
419 D 4,510,935
419 R Re.31,866
4,510,936
422 4,510,937
633 4,510,938
639 4,510,939
667 4,510,940
671 4,510,941
680 4,510,942
4,510,943
687 4,510,944
696 4,510,945

CLASS 130

27 B 4,510,947
27 R 4,510,948
27 T 4,510,946

CLASS 131

109 R 4,510,949
353 4,510,950

CLASS 132

7 4,510,951
37 R 4,510,952
40 4,510,953
75 4,510,954

CLASS 134

1 4,511,407

CLASS 135

25 R 4,510,955
67 4,510,956
84 4,510,957

CLASS 136

246 4,511,755
258 4,511,756

CLASS 137

13 4,510,958
15 4,510,959
75 4,510,960
86 4,510,961
102 4,510,962
117 4,510,963
210 4,510,964
375 4,510,965
4,510,966
389 4,510,967
590 4,510,968
614.05 4,510,969
615 4,510,971
625.28 4,510,972
625.4 4,510,970
625.64 4,510,973

CLASS 138

137 4,510,974

CLASS 139

384 R 4,510,975
435 4,510,976

CLASS 140

123 4,510,977

CLASS 141

65 4,510,978
95 4,510,979

CLASS 144

1 C 4,510,980
246 F 4,510,981

CLASS 148

1.5 4,511,408
2 4,511,409
13.2 4,511,410
20.3 4,511,411
187 4,511,413

CLASS 149

109.6 4,511,412
4,511,414

CLASS 150

52 A 4,510,982

CLASS 152

361 R 4,510,983
362 CS 4,510,984

CLASS 156

48 4,511,415
69 4,511,416
73.5 4,511,417
245 4,511,418
272.6 4,511,419
356 4,511,420
4,511,421
384 4,511,422
425 4,511,423
426 4,511,424
493 4,511,425
497 4,511,426
523 4,511,427
601 4,511,428
643 4,511,429
4,511,430

CLASS 159

47.1 4,511,431
4,511,432

CLASS 160

354 4,510,986

CLASS 162

16 4,511,433

CLASS 164

71.1 4,510,987
102 4,510,988
415 4,510,989
431 4,510,990

CLASS 165

41 4,510,991
45 4,510,992

CLASS 166

75 R 4,510,993
156 4,510,994
217 4,510,995
227 4,510,996
263 4,510,997
295 4,510,998
297 4,510,999
303 4,511,000
310 4,511,001
382 4,511,002

CLASS 169

38 4,511,003

CLASS 172

21 4,511,004
430 4,511,005

CLASS 174

68.5 4,511,757

CLASS 175

7 4,510,985
57 4,511,006
297 4,511,007
369 4,511,008

CLASS 177

1 4,511,009
25 4,511,010

CLASS 178

2 B 4,511,758
2 R 4,511,759
18 4,511,760

CLASS 179

2 EA 4,511,761
9 4,511,762
16 AA 4,511,763
90 AN 4,511,764
90 BD 4,511,765
99 A 4,511,766
4,511,767
146 R 4,511,768

CLASS 180

8.6 4,511,011
65.2 4,511,012
227 4,511,013
233 4,511,014

CLASS 182

2 4,511,015

CLASS 184

6.11 4,511,016

CLASS 187

29 R 4,511,017

CLASS 188

24.12 4,511,018
72.2 4,511,019
73.39 4,511,020
218 XL 4,511,021
299 4,511,022

CLASS 192

18 R 4,511,023

CLASS 198

346 4,511,024
377 4,511,025
469 4,511,026
478 4,511,027
497 4,511,028
621 4,511,029
633 4,511,030
836 4,511,031

CLASS 200

6 A 4,511,769
6 B 4,511,770
61.73 4,511,771
144 C 4,511,773
144 R 4,511,772
147 R 4,511,774
148 A 4,511,775
4,511,776

CLASS 202

99 4,511,434
158 4,511,435
174 4,511,436

CLASS 203

19 4,511,437

CLASS 204

4 4,511,438
37.1 4,511,439
60 4,511,440
98 4,511,441
4,511,442
108 4,511,443
148 4,511,444
158 HE 4,511,445
181 C 4,511,446
4,511,447
198 4,511,448
243 R 4,511,449
278 4,511,450
298 4,511,451
302 4,511,452

CLASS 206

1.5 4,511,032
216 4,511,033
310 4,511,034
363 4,511,035
371 4,511,036
396 4,511,037
454 4,511,038
525 4,511,039
553 4,511,040
566 4,511,041
611 4,511,042
620 4,511,043

CLASS 208

8 LE 4,511,453
10 4,511,454
4,511,455
44 4,511,456
48 AA 4,511,457
59 4,511,458
127 4,511,459
348 4,511,460

CLASS 209

47 4,511,461
140 4,511,462
166 4,511,463
4,511,464
4,511,465
395 4,511,466
522 4,511,044
535 4,511,045
539 4,511,046

CLASS 210

173 4,511,467
181 4,511,468
225 4,511,469
242.3 4,511,470
323.2 4,511,471
340 4,511,472
348 4,511,473
512.1 4,511,474
635 4,511,475
678 4,511,476
689 4,511,477
691 4,511,478
708 4,511,479

CLASS 211

90 4,511,047

CLASS 212

253 4,511,048

CLASS 215

216 4,511,049
219 4,511,050
225 4,511,051
230 4,511,052
252 4,511,053
4,511,054

CLASS 219

10.51 4,511,777
10.55 A 4,511,778
10.55 C 4,511,780
10.55 E 4,511,779
10.77 4,511,781
121 LM 4,511,783
121 P 4,511,782
123 4,511,784
124.34 4,511,785
364 4,511,786
374 4,511,787
405 4,511,788
446 4,511,789
486 4,511,790
497 4,511,791
499 4,511,792

CLASS 220

69 4,511,055
204 4,511,056
306 4,511,057

CLASS 221

2 4,511,058
115 4,511,059
4,511,060
200 4,511,061

CLASS 222

47 4,511,062
75 4,511,063
153 4,511,064
4,511,065
189 4,511,066
230 4,511,067
257 4,511,068
263 4,511,069

CLASS 224

150 4,511,070
156 4,511,071
273 4,511,072

CLASS 227

67 4,511,073
113 4,511,074

CLASS 228

7 4,511,075
180.1 4,511,076
228 4,511,077

CLASS 229

17 R 4,511,078
34 R 4,511,079
41 C 4,511,080

CLASS 235

375 4,511,793
379 4,511,794
4,511,795
492 4,511,796

CLASS 238

59 4,511,081

CLASS 239

3 Re.31,867
8 4,511,082
14 4,511,083
123 B1 4,316,579
223 4,511,084
242 4,511,085
416.3 4,511,086
433 4,511,087
455 4,511,088
553.3 4,511,089
666 4,511,090

CLASS 241

18 4,511,091
49 4,511,092
60 4,511,093

CLASS 242

7.08 4,511,094
18 G 4,511,095
47.01 4,511,096
55 4,511,097
56 R 4,511,098
71.8 4,511,099
86.51 4,511,100
107.7 4,511,101
130.2 4,511,102
186 4,511,103

CLASS 244

118.5 4,511,104
135 R 4,511,105

CLASS 248

65 4,511,106
74.1 4,511,107
188.7 4,511,108
310 4,511,109
421 4,511,110
459 4,511,111
544 4,511,112
546 4,511,113
550 4,511,114
562 4,511,115

CLASS 250

231 SE 4,511,797
4,511,798
367 4,511,799
372 4,511,800
394 4,511,801
484.1 4,511,802
563 4,511,803
578 4,511,804

CLASS 251

5 4,511,116
73 4,511,117
137 4,511,118
216 4,511,119
288 4,511,120

CLASS 252

8.55 E 4,511,480
32.5 4,511,481
34 4,511,482
62.54 4,511,484
62.9 4,511,483
70 4,511,485
90 4,511,486
99 4,511,487
162 4,511,488
172 4,511,489
174.12 4,511,490
404 4,511,491
500 4,511,492
507 4,511,493
518 4,511,494
522 A 4,511,495
4,511,496
542 4,511,497
609 4,511,498
626 4,511,499
633 4,511,500

CLASS 254

50.4 4,511,121
332 4,511,122
364 4,511,123

CLASS 260

112 R 4,511,501
4,511,502
4,511,503
112.5 R 4,511,504
112.7 4,511,505
239 A 4,511,509
239.3 D 4,511,510
239.55 D 4,511,511
245.2 R 4,511,512
404.5 4,511,513
419 4,511,514
429.2 4,511,515
462 R 4,511,516
543 F 4,511,518
549 4,511,517

CLASS 261

94 4,511,519

CLASS 264

22 4,511,520
24 4,511,521
46.4 4,511,522
46.6 4,511,523
61 4,511,524
65 4,511,525
129 4,511,526
328.2 4,511,527
328.8 4,511,528
515 4,511,529
564 4,511,530

CLASS 266

44 4,511,124
135 4,511,125

CLASS 267

140.1 4,511,126

CLASS 269

32 4,511,127
61 4,511,128

CLASS 270

54 4,511,130
4,511,131
58 4,511,132

CLASS 271

3.1 4,511,133
113 4,511,134
126 4,511,135
187 4,511,136

CLASS 272

118 4,511,137

CLASS 273

1 E 4,511,138
26 B 4,511,139
54 B 4,511,140
55 B 4,511,141
87.4 4,511,142
153 R 4,511,143
153 S 4,511,144
167 H 4,511,145
181 J 4,511,146
193 A 4,511,147
326 4,511,148

CLASS 277

3 4,511,149
12 4,511,150
92 4,511,151
207 A 4,511,152

CLASS 279

2 R 4,511,153

CLASS 280

47.26 4,511,154
204 4,511,155
276 4,511,156
289 WC 4,511,157
292 4,511,158
477 4,511,159
701 4,511,160

CLASS 283

1 A 4,511,161

CLASS 285

93 4,511,162
177 4,511,163
252 4,511,164

CLASS 289

8 4,511,165

CLASS 290

2 4,511,805
43 4,511,806
44 4,511,807
54 4,511,808

CLASS 292

29 4,511,166

CLASS 294

28 4,511,167
102.2 4,511,168
116 4,511,169

CLASS 296

1 S 4,511,170
65 R 4,511,171
146 4,511,129
4,511,172
156 4,511,173
173 4,511,174
190 4,511,175
204 4,511,176

CLASS 297

136 4,511,177
146 4,511,178
349 4,511,179
408 4,511,180

CLASS 298

5 4,511,181

CLASS 301

37 P 4,511,182
37 S 4,511,183
63 PW 4,511,184

CLASS 303

6 C 4,511,185

CLASS 305

57 4,511,186

CLASS 307

254 4,511,809
355 4,511,810
463 4,511,811
465 4,511,812
501 4,511,813
572 4,511,814
584 4,511,815

CLASS 308

3.8 4,511,187
6 C 4,511,188
4,511,189
10 4,511,190

CLASS 310

51 B1 3,527,969
313 A 4,511,816
4,511,817
338 4,511,818
340 4,511,819
353 4,511,820
354 4,511,821

CLASS 312

12 4,511,194

CLASS 313

400 4,511,822

CLASS 315

226 4,511,823
297 4,511,824
308 4,511,195

CLASS 318

67 4,511,825
98 4,511,826
254 4,511,827
4,511,828
317 4,511,829
318 4,511,830
351 4,511,831
685 4,511,832
696 4,511,833
700 4,511,834
4,511,835

CLASS 323

300 4,511,836

CLASS 324

61 R 4,511,837
71.5 4,511,838
127 4,511,839
160 4,511,840
321 4,511,841
338 4,511,842
4,511,843
425 4,511,844
444 4,511,845

CLASS 328

164 4,511,846
167 4,511,847

CLASS 329

50 4,511,848
103 4,511,849

CLASS 330

4.3 4,511,850
51 4,511,851
252 4,511,852
259 4,511,853
279 4,511,854
4,511,855
297 4,511,856
311 4,511,857

CLASS 331

10 4,511,858
11 4,511,859
96 4,511,860
108 R 4,511,861

CLASS 332

16 R 4,511,862
18 4,511,863
41 4,511,864

CLASS 333

17 L 4,511,865
189 4,511,202
194 4,511,866
195 4,511,867
257 4,511,868

CLASS 334

20 4,511,869

CLASS 335

213 4,511,870
4,511,871

CLASS 336

83 4,511,872
90 4,511,873

CLASS 337

159 4,511,874
201 4,511,875
244 4,511,876

CLASS 338

2 4,511,877
4 4,511,878
174 4,511,879

CLASS 339

14 R 4,511,196
17 CF 4,511,197
34 4,511,198
45 M 4,511,199
50 R 4,511,200
75 MP 4,511,201
255 P 4,511,203
263 R 4,511,204

CLASS 340

84 4,511,880
347 AD 4,511,883
347 DA 4,511,881
347 DD 4,511,882
4,511,885
347 SY 4,511,884
534 4,511,886
539 4,511,887
571 4,511,888
629 4,511,889
644 4,511,890
734 4,511,891
739 4,511,892
747 4,511,893
756 4,511,894
825.5 4,511,895
870.25 4,511,896

CLASS 343

6 R 4,511,897
736 4,511,898
784 4,511,899
845 4,511,900
915 4,511,901

CLASS 346

76 PH 4,511,902
4,511,903
134 4,511,904
140 A 4,511,905
140 R 4,511,906
4,511,907
206 4,511,908
208 4,511,909
216 4,511,910

CLASS 350

6.1 4,511,205
96.11 4,511,206
96.15 4,511,207
96.16 4,511,208
96.30 Re.31,868
96.34 4,511,209
105 4,511,210
117 4,511,211
255 4,511,212
295 4,511,215
311 4,511,216
336 4,511,217
356 4,511,218
388 4,511,219
403 4,511,220
423 4,511,221
441 4,511,222
523 4,511,223
4,511,224
632 4,511,214

CLASS 351

49 4,511,225
57 4,511,226
208 4,511,227
243 4,511,228

CLASS 354

20 4,511,229
299 4,511,230
301 4,511,231
403 4,511,232
418 4,511,233
428 4,511,234

CLASS 355

1 4,511,235
3 BE 4,511,236
3 DD 4,511,239
3 R 4,511,237
3 SH 4,511,238
14 C 4,511,242
14 CU 4,511,241
4,511,243
14 FU 4,511,244
14 R 4,511,240
43 4,511,245
75 4,511,246

CLASS 356

3 4,511,247
4 4,511,248
5 4,511,249
225 4,511,250
246 4,511,251
375 4,511,252
385 4,511,253

CLASS 357

23.6 4,511,911
36 4,511,912
38 4,511,913
45 4,511,914

CLASS 358

17 4,511,915
28 4,511,916
84 4,511,917
107 4,511,918
120 4,511,919
139 4,511,920
161 4,511,921
166 4,511,922
191.1 4,511,923
197 4,511,924
236 4,511,926
244 4,511,925
250 4,511,927
261 4,511,213
280 4,511,928
296 4,511,929
335 4,511,930

CLASS 360

10.3 4,511,931
33.1 4,511,932
47 4,511,933
55 4,511,934
66 4,511,935
69 4,511,936
72.1 4,511,937
77 4,511,938
93 4,511,939
96.6 4,511,940
105 4,511,941
126 4,511,942
130.23 4,511,943
133 4,511,944

CLASS 361

154 4,511,945
172 4,511,946
191 4,511,947
280 4,511,948
319 4,511,949
413 4,511,950
433 4,511,951

CLASS 362

181 4,511,952
230 4,511,953
275 4,511,954
347 4,511,955

CLASS 363

49 4,511,956
54 4,511,957

CLASS 364

167 4,511,982
200 4,511,958
4,511,959
4,511,960
4,511,961
4,511,962
4,511,963
4,511,964
4,511,965
4,511,966
4,511,967
4,511,968
4,511,969
4,511,983
401 4,511,970
415 4,511,984
426 4,511,971
434 4,511,972
449 4,511,973
463 4,511,974
474 4,511,975
4,511,976
475 4,511,977
480 4,511,978
481 4,511,979
491 4,511,980
492 4,511,981
513 4,511,985
576 4,511,986
715 4,511,987
717 4,511,988
723 4,511,989
748 4,511,990
814 4,511,991
825 4,511,992
900 4,511,993
4,511,994

CLASS 365

8 4,511,995
186 4,511,996
189 4,511,997

CLASS 366

118 4,511,254
138 4,511,255
165 4,511,256
262 4,511,257
337 4,511,258

CLASS 367

11 4,511,998
23 4,511,999
93 4,512,000
189 4,512,001

CLASS 368

10 4,511,259
69 4,511,260
286 4,511,261

CLASS 369

44 4,512,002
45 4,512,003
4,512,004
48 4,512,005
50 4,512,006
127 4,512,007
134 4,512,008
170 4,512,009
220 4,512,010

CLASS 370

60 4,512,011
66 4,512,012
69.1 4,512,013
84 4,512,014
110.1 4,512,015
4,512,016
4,512,017
112 4,512,018

CLASS 371

12 4,512,019
37 4,512,020

CLASS 372

20 4,512,021
45 4,512,022

CLASS 373

36 4,512,023

CLASS 374

37 4,511,262
38 4,511,263
135 4,511,264
151 4,511,265

CLASS 375

34 4,512,024
36 4,512,025
114 4,512,026

CLASS 376

262 4,511,531
461 4,511,532

CLASS 377

16 4,512,027
4,512,028
33 4,512,029
107 4,512,030

CLASS 381

2 4,512,031

CLASS 382

9 4,512,032

CLASS 384

441 4,511,266
536 4,511,191
543 4,511,192
611 4,511,193

CLASS 400

110 4,511,267
119 4,511,268
124 4,511,269
208 4,511,271
214 4,511,270

CLASS 401

6 4,511,272
260 4,511,273

CLASS 402

21 4,511,274

CLASS 403

33 4,511,275
77 4,511,276
140 4,511,277
172 4,511,278
266 4,511,279
274 4,511,280

CLASS 404

10 4,511,281
90 4,511,282
107 4,511,283
111 4,511,284

CLASS 405

66 4,511,285
115 4,511,286
204 4,511,287
217 4,511,288
259 4,511,289
292 4,511,290

CLASS 406

128 4,511,291
152 4,511,292

CLASS 407

41 4,511,293

CLASS 408

232 4,511,294

CLASS 409

233 4,511,295

CLASS 411

20 4,511,296

CLASS 412

8 4,511,297
34 4,511,298

CLASS 413

12 4,511,299

CLASS 414

35 4,511,300
43 4,511,301
327 4,511,302
458 4,511,303
546 4,511,304
755 4,511,305

CLASS 415

136 4,511,306
172 R 4,511,307
191 4,511,308
202 4,511,309

CLASS 416

134 R 4,511,310

CLASS 417

5 4,511,311
45 4,511,312
270 4,511,313
363 4,511,314
366 4,511,315

CLASS 418

150 4,511,316

CLASS 422

61 4,511,533
100 4,511,534
137 4,511,535
171 4,511,536
256 4,511,537
303 4,511,538
311 4,511,539

CLASS 423

26 4,511,540
100 4,511,541
127 4,511,542
167 4,511,543
224 4,511,544
240 4,511,545
305 4,511,546
329 4,511,547
376 4,511,548
574 R 4,511,549

CLASS 424

1.1 4,511,550
4,511,551
14 4,511,552
35 4,511,553
65 4,511,554
74 4,511,555
195.1 4,511,561

CLASS 425

116 4,511,317
133.1 4,511,318
145 4,511,319
199 4,511,320
331 4,511,321
384 4,511,322
385 4,511,323
398 4,511,324

CLASS 426

89 4,511,583
99 4,511,584
106 4,511,585
144 4,511,586
271 4,511,587
302 4,511,588
521 4,511,589
580 4,511,590
603 4,511,591
646 4,511,592
665 4,511,508

CLASS 427

37 4,511,593
38 4,511,594
43.1 4,511,595
44 4,511,596
53.1 4,511,597
58 4,511,598
66 4,511,599
75 4,511,600
79 4,511,601
148 4,511,602
222 4,511,603
246 4,511,605
305 B1 3,963,842
386 4,511,606
402 4,511,604

CLASS 428

13 4,511,607
15 4,511,608
35 4,511,609
4,511,610
4,511,611
36 4,511,612
4,511,613
141 4,511,614
198 4,511,615
203 4,511,616
215 4,511,618
4,511,619
220 4,511,620
285 4,511,621
323 4,511,622
359 4,511,623
379 4,511,624
401 4,511,625
412 4,511,617
425.6 4,511,626
439 4,511,627
457 4,511,628
522 4,511,629
542.2 4,511,630
632 4,511,631
654 4,511,632
666 4,511,633
686 4,511,634
694 4,511,635

CLASS 429

41 4,511,636
100 4,511,637
111 4,511,638

CLASS 430

108 4,511,639
157 4,511,640
158 4,511,641
161 4,511,642
212 4,511,643
219 4,511,644
276 4,511,645
283 4,511,646
381 4,511,647
503 4,511,648
553 4,511,649
559 4,511,650

CLASS 431

10 4,511,325
53 4,511,326
201 4,511,327

CLASS 432

59 4,511,328
106 4,511,333

CLASS 433

17 4,511,331
18 4,511,330
31 4,511,329
59 4,511,332
165 4,511,334
173 4,511,335
4,511,336

CLASS 434

43 4,511,337

CLASS 435

15 4,511,651
29 4,511,652
69 4,511,653
95 4,511,654
149 4,511,655
161 4,511,656
253 4,511,657

CLASS 436

130 4,511,658
150 4,511,659
163 4,511,660
503 4,511,661
513 4,511,662

CLASS 440

26 4,511,338
89 4,511,339

CLASS 445

6 4,511,340

CLASS 446

9 4,511,341
429 4,511,342
463 4,511,343

CLASS 455

2 4,512,033
139 4,512,034
165 4,512,035
612 4,512,036

CLASS 464

139 4,511,344
145 4,511,345
146 4,511,346

CLASS 474

43 4,511,347
109 4,511,348

CLASS 494

16 4,511,349
82 4,511,350

CLASS 501

4 4,511,663
35 4,511,664
96 4,511,665
98 4,511,666

CLASS 502

64 4,511,667
84 4,511,668
110 4,511,669
209 4,511,670
242 4,511,671
243 4,511,672
525 4,511,673

CLASS 514

8 4,511,558
27 4,511,560
54 4,511,559
112 4,511,562
162 4,511,563
167 4,511,564
173 4,511,565
242 4,511,566
253 4,511,567
263 4,511,557
282 4,511,570
290 4,511,569
293 4,511,568
332 4,511,573
340 4,511,572
351 4,511,571
371 4,511,574
423 4,511,575
4,511,576
448 4,511,577
469 4,511,578
490 4,511,579
578 4,511,580
601 4,511,735
617 4,511,581
654 4,511,582
743 4,511,556

CLASS 518

714 4,511,674

CLASS 521

26 4,511,675
4,511,676
28 4,511,677
49.5 4,511,680
52 4,511,678
83 4,511,679

CLASS 523

310 4,511,681
402 4,511,682

CLASSIFICATION OF PATENTS

CLASS 524

3	4,511,683
101	4,511,684
110	4,511,685
	4,511,686
270	4,511,687
380	4,511,688
484	4,511,689
606	4,511,690
745	4,511,691

CLASS 525

7	4,511,692
54.1	4,511,694
67	4,511,693
80	4,511,695
92	4,511,696
139	4,511,697
154	B1 3,037,963
163	B1 2,978,437
187	4,511,698
205	4,511,699
283	4,511,700
533	4,511,701

CLASS 526

90	4,511,702
125	4,511,703
	4,511,704

CLASS 528

26	4,511,705
192	4,511,706
250	4,511,707
274	4,511,708
331	4,511,709
485	4,511,710
488	4,511,712
489	4,511,711

CLASS 534

629	4,511,507
631	4,511,506

CLASS 536

27	4,511,713

CLASS 544

225	4,511,715
277	4,511,716
353	4,511,717
406	4,511,718

CLASS 546

245	4,511,719
273	4,511,720
308	4,511,721

CLASS 548

215	4,511,714
231	4,511,722
376	4,511,723
452	4,511,724
530	4,511,725

CLASS 549

283	4,511,726

CLASS 556

418	4,511,727
419	4,511,728

CLASS 560

020	4,511,729
033	4,511,730
061	4,511,731
221	4,511,732
253	4,511,733

CLASS 562

524	4,511,734

CLASS 564

214	4,511,736
257	4,511,737

CLASS 568

14	4,511,738
454	4,511,740
473	4,511,739
484	4,511,741
614	4,511,742
814	4,511,743
864	4,511,744

CLASS 570

241	4,511,745

CLASS 585

323	4,511,746
415	4,511,747
467	4,511,748
469	4,511,749
526	4,511,750
608	4,511,751
656	4,511,754
739	4,511,752
856	4,511,753

CLASS 604

56	4,511,351
	4,511,352
85	4,511,353
98	4,511,354
131	4,511,355
164	4,511,356
323	4,511,357
327	4,511,358
411	4,511,359

CLASSIFICATION OF DESIGNS

D2—	28	278,375
		278,376
		278,377
		278,378
		278,379
	38	278,389
	234	278,380
	244	278,381
	320	278,382
		278,383
	360	278,384
	380	278,385
	383	278,386
D3—	7	278,387
	71	278,388
D4—	129	278,390
D6—	310	278,394
	332	278,395
	361	278,392
	366	278,391
	370	278,396
	374	278,393
	440	278,397
	505	278,398
		278,399
	553	278,400
D7—	13	278,401
	104	278,402
	360	278,403
D8—	34	278,405
	38	278,406
	61	278,407
	98	278,408
D9—	316	278,409
	403	278,410
		278,411
	420	278,412
	446	278,413
		278,414
D10—	40	278,415
	109	278,416
D11—	27	278,417
	90	278,418
	121	278,419
	136	278,420
	162	278,421
D12—	110	278,422
	147	278,423
	157	278,424
D13—	1	278,425
	5	278,426
	12	278,427
D14—	1	278,428
	3	278,429
	5	278,430
	36	278,431
	39	278,432
	53	278,433
	60	278,434
	101	278,435
D15—	28	278,436
	68	278,437
	70	278,438
	127	278,439
	141	278,440
D16—	40	278,441
D17—	20	278,442
D18—	1	278,404
		278,443
		278,444
D19—	26	278,445
D21—	63	278,446
	76	278,447
	116	278,448
	137	278,449
	141	278,450
	145	278,451
		278,452
	190	278,453
		278,454
	196	278,455
D22—	13	278,456
D23—	2	278,457
	25	278,458
	42	278,459
	90.1	278,460
D24—	68	278,461
D26—	3	278,462
	113	278,463
D29—	2	278,464
D30—	12	278,465
	15	278,466
	19	278,467
D92—	1.1	278,468
D99—	29	278,469

CLASSIFICATION OF PLANTS

P.—	8	5,436
	9	5,437
	41	5,438
	73	5,439
	77	5,440
	80	5,441

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,510,913
4,511,204
4,511,388
4,511,463
4,511,721
04 : 4,510,634
4,510,766
4,510,846
4,510,850
4,510,912
4,511,157
4,511,809
4,511,888
4,511,892
05 : 4,511,141
06 : 4,510,630
4,510,636
4,510,650
4,510,651
4,510,661
4,510,672
4,510,681
4,510,694
4,510,709
4,510,718
4,510,728
4,510,737
4,510,757
4,510,779
4,510,780
4,510,784
4,510,798
4,510,812
4,510,816
4,510,838
4,510,855
4,510,877
4,510,878
4,510,890
4,510,923
4,510,954
4,510,967
4,510,971
4,510,972
4,511,011
4,511,038
4,511,041
4,511,046
4,511,052
4,511,065
4,511,067
4,511,084
4,511,094
4,511,106
4,511,113
4,511,139
4,511,145
4,511,148
4,511,149
4,511,153
4,511,159
4,511,162
4,511,164
4,511,171
4,511,179
4,511,182
4,511,183
4,511,193
4,511,195
4,511,196
4,511,207
4,511,220
4,511,231
4,511,238
4,511,274
4,511,278
4,511,284
4,511,287
4,511,288
4,511,295
4,511,309
4,511,321
4,511,325
4,511,331
4,511,342
4,511,343
4,511,349
4,511,351
4,511,352
4,511,353
4,511,356
4,511,362
4,511,394
4,511,406
4,511,407
4,511,423
4,511,432
4,511,490
4,511,502
4,511,503
4,511,516
4,511,544
4,511,545
4,511,599
4,511,601
4,511,652
4,511,662
4,511,675
4,511,701
4,511,735
4,511,745
4,511,746
4,511,750
4,511,763
4,511,785
4,511,811
4,511,815
4,511,829
4,511,846
4,511,850
4,511,857
4,511,931
4,511,942
4,511,943
4,511,952
4,511,968
4,511,986
4,511,995
4,512,018
4,316,579
08 : 4,510,642
4,510,977
4,510,993
4,511,215
4,511,242
4,511,250
4,511,303
4,511,376
4,511,614
4,511,841
4,511,868
4,511,964
09 : 4,510,708
4,510,758
4,510,823
4,510,884
4,510,892
4,510,900
4,510,924
4,510,969
4,511,069
4,511,178
4,511,209
4,511,350
4,511,371
4,511,410
4,511,558
4,511,575
4,511,576
4,511,636
4,511,725
4,511,773
4,511,884
4,512,021
10 : Re.31,868
4,510,870
4,511,392
11 : 4,510,952
12 : 4,510,632
4,510,701
4,510,794
4,510,879
4,510,945
4,511,004
4,511,088
4,511,131
4,511,137
4,511,155
4,511,158
4,511,299
4,511,335
4,511,354
4,511,358
4,511,435
4,511,438
4,511,570
4,511,590
4,511,688
4,511,762
4,511,768
4,511,787
4,511,813
4,511,927
4,511,928
4,511,937
4,511,963
4,512,026
4,512,035
13 : 4,510,649
4,510,710
4,511,042
4,511,886
16 : 4,511,018
4,511,230
4,511,541
17 : 4,510,660
4,510,666
4,510,679
4,510,689
4,510,698
4,510,763
4,510,828
4,510,854
4,510,941
4,510,944
4,510,962
4,511,043
4,511,048
4,511,071
4,511,115
4,511,146
4,511,181
4,511,257
4,511,258
4,511,298
4,511,324
4,511,357
4,511,408
4,511,434
4,511,466
4,511,468
4,511,492
4,511,514
4,511,528
4,511,529
4,511,609
4,511,613
4,511,654
4,511,730
4,511,820
4,511,834
4,511,835
4,511,859
4,511,880
4,511,889
4,511,899
4,512,011
18 : 4,510,753
4,510,858
4,510,899
4,510,916
4,510,927
4,510,963
4,511,032
4,511,140
4,511,142
4,511,175
4,511,304
4,511,651
4,511,656
4,511,771
4,511,871
4,511,921
4,511,924
4,511,949
19 : 4,510,776
4,510,777
4,510,778
4,510,814
4,511,080
4,511,130
4,511,211
4,511,779
4,511,900
20 : 4,510,751
4,510,937
4,510,986
4,511,028
4,511,658
21 : 4,510,713
4,510,883
4,511,049
4,511,111
4,511,134
4,511,380
4,511,572
4,511,732
22 : 4,510,996
4,511,291
4,511,367
4,511,368
4,511,542
4,511,716
4,511,729
4,511,753
4,511,925
23 : 4,511,197
24 : 4,510,790
4,510,881
4,510,931
4,511,144
4,511,263
4,511,339
4,511,534
4,511,556
4,511,600
4,511,713
4,511,777
25 : 4,510,626
4,510,684
4,510,716
4,510,805
4,510,875
4,510,922
4,511,079
4,511,096
4,511,163
4,511,216

4,511,222
4,511,225
4,511,229
4,511,273
4,511,403
4,511,425
4,511,472
4,511,602
4,511,616
4,511,659
4,511,693
4,511,799
4,511,874
4,511,953
4,511,960
26 : 4,510,674
4,510,675
4,510,693
4,510,717
4,510,724
4,510,752
4,510,754
4,510,770
4,510,872
4,510,887
4,510,904
4,511,024
4,511,112
4,511,128
4,511,151
4,511,152
4,511,161
4,511,173
4,511,187
4,511,198
4,511,251
4,511,276
4,511,346
4,511,428
4,511,441
4,511,464
4,511,477
4,511,524
4,511,563
4,511,603
4,511,620
4,511,638
4,511,727
4,511,731
4,511,831
4,511,838
4,511,936
4,511,945
4,511,954
4,511,965
4,427,417
27 : 4,510,682
4,510,720
4,510,768
4,511,119
4,511,121
4,511,174
4,511,210
4,511,255
4,511,311
4,511,427
4,511,583
4,511,585
4,511,593
4,511,626
4,511,641
4,511,646
4,511,686
4,511,692
4,511,715
4,511,967

29 : 4,511,994
4,510,740
4,511,015
4,511,302
4,511,480
4,511,521
4,511,672
4,511,844
4,511,876
30 : 4,510,824
31 : 4,510,663
4,511,005
4,511,389
32 : 4,511,281
4,511,282
33 : 4,510,726
4,511,413
4,511,905
34 : 4,510,652
4,510,671
4,510,755
4,510,803
4,510,928
4,510,939
4,510,998
4,511,017
4,511,030
4,511,035
4,511,050
4,511,109
4,511,125
4,511,247
4,511,265
4,511,359
4,511,395
4,511,415
4,511,443
4,511,445
4,511,479
4,511,481
4,511,482
4,511,488
4,511,494
4,511,498
4,511,527
4,511,537
4,511,554
4,511,569
4,511,608
4,511,640
4,511,670
4,511,682
4,511,702
4,511,706
4,511,724
4,511,747
4,511,782
4,511,817
4,511,865
4,511,885
4,511,918
4,511,922
4,511,930
4,511,946
4,511,969
4,512,013
4,512,016
4,512,017
4,512,022
4,512,024
4,512,034
35 : 4,510,799
4,510,930
4,511,003
4,511,219
4,511,373

4,511,374
4,511,455
4,511,661
36 : 4,510,641
4,510,673
4,510,676
4,510,680
4,510,686
4,510,690
4,510,697
4,510,734
4,510,806
4,510,825
4,510,852
4,510,862
4,510,888
4,510,909
4,510,920
4,510,929
4,510,955
4,510,956
4,510,982
4,511,072
4,511,077
4,511,083
4,511,091
4,511,177
4,511,243
4,511,244
4,511,248
4,511,252
4,511,272
4,511,279
4,511,297
4,511,314
4,511,329
4,511,330
4,511,337
4,511,375
4,511,377
4,511,400
4,511,416
4,511,430
4,511,431
4,511,440
4,511,474
4,511,485
4,511,486
4,511,497
4,511,515
4,511,535
4,511,555
4,511,573
4,511,597
4,511,621
4,511,630
4,511,657
4,511,663
4,511,712
4,511,760
4,511,824
4,511,840
4,511,852
4,511,855
4,511,862
4,511,887
4,511,972
4,512,025
37 : 4,510,633
4,510,685
4,510,914
4,510,934
4,510,938
4,511,579
4,511,582

4,511,798
4,511,894
4,511,979
39 : Re.31,867
4,510,731
4,510,756
4,510,786
4,510,788
4,510,843
4,510,848
4,510,980
4,511,021
4,511,037
4,511,047
4,511,051
4,511,090
4,511,105
4,511,127
4,511,166
4,511,201
4,511,228
4,511,318
4,511,328
4,511,341
4,511,361
4,511,383
4,511,385
4,511,422
4,511,444
4,511,446
4,511,454
4,511,489
4,511,519
4,511,548
4,511,551
4,511,584
4,511,592
4,511,607
4,511,625
4,511,628
4,511,677
4,511,699
4,511,700
4,511,742
4,511,791
4,511,825
4,511,869
4,511,882
4,511,947
4,511,976
40 : 4,510,712
4,510,889
4,511,001
4,511,307
4,511,405
4,511,465
4,511,669
41 : 4,510,688
4,510,692
4,510,917
4,511,235
4,511,793
4,512,033
42 : 4,510,637
4,510,653
4,510,683
4,510,703
4,510,707
4,510,760
4,510,769
4,510,826
4,510,836
4,510,857
4,510,860
4,510,861

4,510,953
4,510,958
4,510,959
4,510,966
4,511,044
4,511,054
4,511,107
4,511,120
4,511,123
4,511,154
4,511,226
4,511,262
4,511,264
4,511,296
4,511,306
4,511,365
4,511,390
4,511,417
4,511,447
4,511,453
4,511,459
4,511,460
4,511,499
4,511,511
4,511,513
4,511,531
4,511,568
4,511,605
4,511,666
4,511,676
4,511,690
4,511,754
4,511,757
4,511,801
4,511,832
4,511,872
4,511,898
4,511,948
2,978,437
3,037,963
44 : 4,510,772
4,511,895
45 : 4,510,647
4,510,773
4,510,834
4,511,075
4,511,691
4,511,961
47 : 4,510,627
4,510,761
4,511,059
4,511,060
4,511,310
4,511,637
4,511,766
48 : 4,510,665
4,510,696
4,510,711
4,510,725
4,510,797
4,510,800
4,510,801
4,510,835
4,510,960
4,510,970
4,510,985
4,510,989
4,510,994
4,510,995
4,510,997
4,510,999
4,511,000
4,511,002
4,511,008
4,511,062

4,511,063
4,511,070
4,511,124
4,511,135
4,511,168
4,511,169
4,511,234
4,511,283
4,511,378
4,511,381
4,511,382
4,511,450
4,511,452
4,511,457
4,511,473
4,511,501
4,511,533
4,511,586
4,511,598
4,511,696
4,511,710
4,511,740
4,511,781
4,511,842
4,511,851
4,511,914
4,511,987
4,511,999
4,512,001
3,654,638
49 : 4,510,628
4,511,147
4,511,399
4,511,476
50 : 4,510,918
4,511,911
51 : 4,510,639
4,510,842
4,510,950
4,511,203
4,511,205
4,511,767
4,511,861
4,511,863
4,511,896
53 : 4,510,700
4,510,714
4,510,802
4,510,837
4,511,114
4,511,122
4,511,143
4,511,170
4,511,478
4,511,552
4,511,856
4,511,919
54 : 4,511,741
55 : 4,510,631
4,510,741
4,510,851
4,510,859
4,511,033
4,511,040
4,511,055
4,511,200
4,511,347
4,511,520
4,511,522
4,511,772
4,511,774
4,511,790
4,511,818
4,511,848
4,511,977

DESIGN PATENTS

06 : 278,380
278,387
278,405
278,412
278,424
278,427
278,432
278,442
278,450
278,453
278,454

09 : 278,391
278,393
278,407
278,408
12 : 278,386
278,419
13 : 278,400
278,459
17 : 278,384
278,403
278,415

278,440
18 : 278,420
20 : 278,389
22 : 278,456
25 : 278,448
278,464
26 : 278,395
278,451
278,452
27 : 278,381
278,436

29 : 278,397
278,469
34 : 278,413
278,434
36 : 278,375
278,376
278,377
278,378
278,379
278,446
278,455

278,458
278,460
278,465
39 : 278,394
278,416
278,463
278,466
40 : 278,431
41 : 278,390
278,433
42 : 278,417

278,462
43 : 278,402
44 : 278,445
47 : 278,449
48 : 278,418
49 : 278,467
50 : 278,396
51 : 278,468
53 : 278,426
55 : 278,398
278,399

PLANT PATENTS

06 : 5,436

5,437

5,438

5,440

5,441

U.S. GOVERNMENT PRINTING OFFICE : O—1985

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ **Domestic; @ $** **Foreign.**

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, Acting Commissioner